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FREDERICK III







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The following translation of the Official History of the illness and death of the Emperor Frederic III of Germany was made by me for a London newspaper, and was set up in type, but the Editor ultimately decided not to publish it. I procured a set of corrected proofs, and it may be presumed that no other copy is in existence.

R. Brudenell Carter.





THE ILLNESS OF FREDERICK III.

(Described from Official Sources, and from the Reports posted in the Royal Household Ministry. By Sir Professor Jordelehn, Surgeon-General of the First and Super or Royal Medical Privy Councillor, of Berlin; Professor von Bergmann, Surgeon-General of the First and Medical Privy Councillor, of Berlin; Dr. Bergmann, First Assistant in the Royal Surgical Clinic of Berlin; Professor (Gerhardt, Medical Privy Councillor, of Berlin; Professor (Nussbaum, Privy Councillor, of Strasburg, in Elsass; Dr. Landgraf, Staff Surgeon, of Berlin; Dr. Moritz Schmidt, Sanitary Councillor, of Frankfurt a. M.; Professor Schnitzler, Director of the Laryngologic Clinic, of Vienna; Professor Tobold, Sanitary Privy Councillor, of Berlin; Professor Waldeyer, Medical Privy Councillor, of Berlin. The Imperial Files, Berlin, 1888.)
REPORT OF DR. C. GERHARDT, PROFESSOR IN THE ROYAL UNIVERSITY OF BERLIN, AND MEDICAL PRIVY COUNCILOR.

"BEGINNING OF THE ILLNESS.

"His Imperial and Royal Highness, the then Crown Prince of the German Empire and of Prussia, had suffered since January, 1887, from continued hoarseness, which slowly increased. It was accepted as a possible explanation of the obstinacy of the malady that his Imperial Highness was compelled to speak much, and that he did not always avoid exposure to cold with the care that was desirable. The malady commenced with symptoms of cold, and at first seemed to be a catarrhal hoarseness. In the next months, however, cough and other catarrhal symptoms were not present. There was only hoarseness, and the various remedies and inhalations which are usually efficacious against catarrh were employed, wholly without effect.

"On the 6th of March, 1887, at the request and in the presence of Surgeon-General Dr. Wegner, I examined the larynx with the laryngoscope. The vocal cords were of a slight uniform redness. During respiration there was visible on the margin of the left vocal cord, between the vocal process and the centre of the cord itself, but nearer to the former, a pale, tongue-like or flap-like, apparently somewhat uneven protuberance, about four millimetres in length and two millimetres in height. In phonation the two vocal cords came close together; and at the indicated point an elongated, low, pale red nodule rose above the level of the clink of the glottis.

"In inspiration, the vocal cords separated freely from one another, and the reddish white elevation was again visible to a greater extent. The elevation easily accompanied all movement of the vocal cord; that is to say, there was no rigidity or difficulty of movement of the cord.

"Hoarseness was occasioned by the new formation being wedged between the vocal cords in phonation, when the vibration of both cords was impeded. The new formation was a polypous thickening of the margin of the left vocal cord, and the indication for treatment was the removal of the growth. The next days were employed in accustoming the august patient to the introduction of probes and instruments. The application of cocaine, for the purpose of rendering the larynx insensitive to the contact of instruments, was well borne in large doses (10 and 20 per cent. solutions). On the other hand there were no difficulties, arising from the narrow formation of the entrance to the larynx, from pain occasioned by drawing forward the tongue, and from other small circumstances, which were only gradually overcome or obviated. The first attempts to remove the growth by means of a loop of wire curved slightly towards the right, and carried below the left vocal cord, brought away only once a small whitish portion from the surface of the growth, and this portion, as well as the growth itself to the contact of a probe, felt somewhat hard. Subsequent endeavours to remove the growth by a ring knife were defeated by its flatness, smoothness, and firmness. It was then determined to attempt its destruction by the galvanic cautery.

"Before this was done, on the 14th at midday, a minute examination was made by sunlight. The margin of the vocal cord could then be made out from the growth, and seemed to be free. But immediately after the margin of the vocal cord, beginning at the already mentioned, just in front of the vocal process, there was a somewhat flattened elevation, originally visible during respiration; while during phonation the glottis at this point appeared somewhat uneven. The colour of the elevation was reddish white, its surface not perfectly smooth. On the evening of the 14th the red-hot platinum wire was applied for the first time. Thereupon a small white eschar became visible, the whole vocal cord was reddened, the voice immediately became better, then for a short time more hoarse, then continuously better. The same evening and on the following morning there was slight difficulty in swallowing.

"On the 16th the cautery was applied over the whole extent of the growth, and especially at its centre. This time there was little pain, and the voice again improved. On the 18th the growth appeared considerably smaller, divided by a furrow in the middle, and pale red; the vocal cords slightly red-bordered. There was no disturbance of movement of the left cord, and the voice was considerably better. The treatment was suspended from the 18th to the 26th on account of the birthday fete of His Majesty the Emperor Wilhelm.

"On the 26th the growth appeared whitish, of a flattened prominence, now about half a centimetre long, smooth on the surface. In phonation it entered into the posterior part of the glottis. The cautery was again applied to the growth on the 26th, 27th, 29th, and from thence daily until the 7th of April. The growth that protruded was burnt away; and on the 7th the margin of the vocal cord was smoothed over with a flat cautery. Examinations by sunlight, on the 8th and 9th, showed moderate diffused redness of the left vocal cord, and slight concavity of its margin, corresponding to the anterior extremity of the growth. If the growth itself nothing could be seen, but in the position it had occupied there was an uneven reddish granulating surface below the margin of the vocal cord. The general condition was excellent; there was no cough, no expectoration, the voice still rose, but was not quite better tone than before, better in the morning than in the evening. The pain in swallowing, which at first was only felt occasionally, afterwards became constant, and, although of such slight severity as to be only mentioned in reply to questions, was an unpleasant symptom. The august patient at this time considered himself almost well.

"Even before the first examination Surgeon-General Dr. Wegner had suggested treatment at Ems, even if only in order to afford a rest of some weeks to the here overstrained vocal organs of the august patient, and this suggestion could only be regarded as wise. As Wegner returned to the beginning of April, and as the day for departure was fixed, it was desirable to destroy the growth completely in the quickest way, so that the period spent at Ems might be available for the healing of the resulting wound. The journey being fixed for the 12th, the growth was removed on the 10th, and for the next few days the wound remained smooth and even, although not yet skinned over. In order to avoid the possibility of any infection, inhalations of a solution containing a half per cent. of cocaine salt, and with half per thousand of carbolic sublimate were employed in the beginning of April, and also at Ems. The stay at Ems had yet another intention. Even from the beginning of April I had entertained suspicions of the nature of the growth. At first, notwithstanding its somewhat unusual size and aspect, it had to be considered and treated as benign. It was necessary that it should be removed. No one could have ventured to look on quietly while the growth increased. It must be removed; and, if it were cancerous, its removal would be salutary. If the nature of the new formation it be recognized. The growth was destroyed, and it was necessary to see whether, with complete rest and under the most favourable external conditions, it would reappear. This question the stay at Ems would determine.

"THE DIAGNOSIS OF CANCER.

growths upon the vocal cords, the so-called polyps, the squamous papillomata, adenomata, are developed ponderating frequency upon the anterior third of the larynx. The seat alone of this growth was therefore favorable. Still a papilloma may occur in such a position. A growth were benign, it must first be regarded as a papilloma. According to the classification of Virchow, it might belong to the second form of papillomata. Its appearance was different from that of the common form. It was more extensively united with the margin of the cord, and seemed rather a thickening than an outgrowth from the inner side of the cord. During the treatment by galvanic cautery it showed itself to be hard, it revolved out in an unusual way, and changed its aspect almost from day to day in a manner which I had never before seen in any of numerous benign growths. However, I proceeded with the treatment, under the conviction that I had a benign growth before me. When the customary snares and knives slipped off, and what was destroyed one day by the hot wire was half reproduced by the next, there arose doubts. Once already, before the Emperor's birthday, I had burnt away the greater part of the growth; and yet, after eight days, it was larger than before. It was now the object to destroy the growth in the most lasting manner, by daily deep cauterization, until the vocal cord no longer retained its original form. This was accomplished between the 29th of March and the 7th of April. Yet the surface of the wound neither healed nor suppurated, but remained during the following days a mere wound-surface. Benign laryngeal growths may very well recur; but they heal in the first place when burnt away, and then, after a longer or shorter time, a new formation may gradually appear. We had quite another condition, in which the growth continually increased beneath the seal of the cauterization. My suspicions were hence excited even early in April. My patient was of that age at which laryngeal cancer most frequently occurs; and the growth, which had an aspect and a mode of increase different from that of any benign tumour which I had treated, reminded me of many cases of cancer only too strongly. These suspicions were not coraeled from the surgeon-in-ordinary, Surgeon-General Dr. Wegner, but were explained to him in the most earnest manner. They were still only suspicions, but they derived support from numerous small circumstances. It was clearly necessary, in the first place, to determine upon the confirmatory signs for one or other form of disease, polypus or cancer, and then to decide the diagnosis in accordance with their occurrence. I therefore said that after a fortnight's rest at Ems we should know whether the base of the tumour would heal or not, and whether a new growth would appear or not. I said that after a fortnight it would be possible to speak with certainty about the diagnosis, and I delivered, by request, an accurate specification of my places of sojourn during this time in writing.

Yet another symptom was to bring the decision. The formation of cancer on a vocal cord is usually soon attended by a remarkable rigidity of the cord, so that it is stiff and slow in its movements as a whole, to an extent which the mechanical effect of the visible growth in no way explains. So far I had carefully observed that both vocal cords moved equally. If, with a return of the growth, the mobility of the left cord were diminished—especially if it were diminished out of proportion to the actual growth—then the malignancy of the new formation must be admitted.

The newspaper intelligence from Ems justified no confidence. The only direct intelligence I received was by a letter from Surgeon-General Dr. Wegner, a few days before the return of the august patient, stating that the assistance of a laryngeal specialist was desired. I led myself of the opportunity to see Dr. Wegner in person, and to beg of him, in case the growth had increased, as I suspected from my intelligence, or if the cord were less mobile, to support my wish that the surgeon should now be taken into consultation. There might as many laryngeal specialists as were desired, but at present only a surgeon was necessary, and in the case supposed, would none be able to run assistance.

On the 10th of April, at 10 o'clock, I was accompanied by the Emperor, the Empress, and the Imperial Family, to the consultation chamber, where I was to be a matter of conscience and duty that I preserve ourselves from the reproach of neglecting to recognize the nature of the disease until it was no longer curable, even by means of an external operation.

We discussed the past history of the august patient in order to see whether any constitutional cause for the existing malady could be discovered. Surgeon-General Dr. Wegner assured us that any suspected origin of infectious disease (afterwards often mentioned by officious persons) might be absolutely excluded. There was no glanular swelling in the neck, in the throat only a tendency to catarrh, no scar or the like. In short, after conscientious consideration, the suggestion could be excluded.

Could the disease be tuberculosis? This very seldom forms large growths in the larynx. The august patient had not been feverish, had not coughed, his lungs were free from disease, and he was at that time in a picture of health. This also was excluded. There remained only the narrow decision, benign or malignant laryngeal tumour, polypus, or cancer. I had tormented myself with the idea of cancer for weeks, and still I might have been over-suspicious. I felt that the gloomy apprehensions of sleepless nights might be corrected by the well-considered conclusions of the day. Only if, after weeks of rest at Ems, the growth had rapidly increased and the mobility of the left cord were further diminished, would I speak the decisive word, but would speak it then with certainty and without fear.

His Imperial Highness left for Ems on the 16th of April, and on the morning of the 16th of May returned to Potsdam. At this date the voice was louder than before, and the growth was larger. It elevated the reddened mucous membrane of the upper surface of the vocal cord, and formed on the inner side of the cord a flat, uneven, grayish red projection, without any cicatrix of the wound left by the cauterization. The posterior border of the growth was more than formerly marked off by a furrow from the vocal process. The left cord was clearly slow in its movement than the right. My worst apprehensions were fulfilled. I did not conceal from the august patient that the growth had again increased, and he wished that the treatment by the galvanic cautery should at once be recommenced. I asked for delay, and Ems, in compliance with the order received, for the assistance of one or more laryngeal specialists, naming the four specialists of this kind who were best known to me in Berlin, and strongly pressed that a surgeon, and especially Privy Councillor von Bergmann, should be added to the consultation, as it referred to a tumour on which the advice of a surgeon must be helpful. My advice was approved. The selection of a laryngeal specialist was decided until V. Bergmann had been consulted.

Once asked by Surgeon-General Dr. Wegner, in conversation with him about the disease and its nature, influenced nor attempted to influence his patient. He made his examination on the 16th, and only declared that, on account of the possible recurrence, the larynx ought to be removed, and a complete extirpation of the growth was indicated in this way. After the consultation, the opinion of laryngeal specialists was again sought. Dr. Wegner. Several names were mentioned, that of Mackenzie by Dr. Wegner. Von Bergmann and I, considering that the laryngeal appearance, and the history were so clear that every one who could use a laryngoscope must arrive at the same conclusion. This supposition appeared to be realized on the 18th. On that day there was a large meeting of consultants, comprising his Excellency von Bergmann, Privy Councillor Tobold, sent by His Majesty the Emperor, besides Surgeon-General Dr. Wegner, Surgeon-Major Schrade, Von Bergmann, and myself. Privy Councillor Tobold carefully examined the larynx with the mirror, and declared, as soon as we entered the consultation chamber, that he could arrive at no

than a diagnosis of cancer. The other Consultants concurred, and it was unanimously recommended that the larynx should be opened with the least possible delay, and the growth removed.

"The diagnosis of laryngeal cancer, unanimously made by the above-named six surgeons on the 18th of February upon these grounds—

"1. Upon the quick recurrence of the tumour.

"2. Upon the hardness and irregular surface of the tumour.

"3. Upon the persistence of the wound on the inner side of the tumour.

"4. Upon the impeded mobility of the vocal cord.

"5. Upon the certainty that tuberculous and other forms of infectious disease might be excluded.

"6. Upon a number of harmonizing circumstances."

"Among the latter were the age of the patient, the seat and aspect of the growth, the fact that the cauterization wound neither suppurated nor healed, and many small aetiological inferences and diagnostic observations which were special to the case.

"The diagnosis was arrived at earlier than in many other cases, and seemed to be as certainly established as was possible at this stage—so certainly, at least, that all the surgeons who took part in the consultation were ready to assume responsibility for the practical measures which would follow from it.

"Although a few cases of laryngeal sarcoma and one of laryngeal cancer are recorded as having been cured by removal through the mouth, yet there was no possibility of so removing a growth so flat, united for so considerable a breadth, and without visible boundary, to the vocal cord, so that it appeared to be a swollen cord itself, which, once the assumption of cancerous nature was accepted. In such a case attempts to remove the growth through the mouth must be abandoned, on the grounds which, in the present case, were clearly laid down by Desormeaux. It was necessary to open the larynx.

"This operation, with the application of the cautery, is a free, safe, and, if performed, without exception, even for benign tumours, and even upon children and the aged. By this means only would it be possible to remove the whole of the disease by the aid of light, and to be sure that no source of recurrence was left behind. The diagnosis of the clinical physician had established the nature of the malady at the earliest possible time. The surgeon had the most favourable case imaginable before him—an energetic subject of vigorous strength, from whom it was proposed to remove radically a small tumour of about half a centimetre in diameter. The seat of the tumour, which projected from the margin of the vocal cord, would materially facilitate its removal. No statistics could express the full probability of a permanent cure such as it was in this instance. The fact that the nature of the growth been so early recognized—I might say in its germ; and the constitution of the august patient was the strongest that could be imagined. All possible adjuncts were at command. It was doubtful whether at that time the necessary wound would be limited to the soft parts, or whether a portion of the thyroid cartilage would also require removal. One weighty consideration was not concealed. The removal of a considerable portion of a vocal cord would permanently impair the voice; but of what importance was the voice in comparison with life? And in this case, as in others, the return of a voice, which, although permanently hoarse, would yet be loud, might ultimately be expected.

On the evening of the 20th all preparations for the operation were completed to the smallest detail; and on the next morning it was to be performed.

"THE OPPOSITION.

"At Emst's calling in of a laryngeal specialist had been considered, it is rumoured, at the suggestion of the physician there in charge. When I, according to command, made the same proposal, and mentioned the names of four German laryngologists, the matter was ordered to stand over until Von Bergmann's arrival. At the consultation of the evening of the 16th of May, Surgeon-General Dr. Wegner mentioned Mackenzie; we mentioned

other names, but we finally decided upon Mackenzie. He came on the evening of the 20th to a consultation, which was attended by the surgeons already mentioned. Mackenzie received a detailed report of our observations and opinions, examined the throat, and at once declared that he did not regard the disease as cancer, that the aspect was not that of a cancerous swelling, and that he should oppose any external operation until the cancerous character was established by the microscopic examination of a portion to be removed through the mouth.

"The postponement of the operation for the microscopic examination was conceded by all; Mackenzie was to remove the portion of the growth, and the assistance of Virchow was to be sought for the microscopic examination. On the 21st, in the morning, Mackenzie removed a small portion of tissue. Immediately afterwards I saw a small mass of substance in the mucous membrane of the upper surface of the left vocal cord, near the outer margin of the growth. At the bottom of this loss of substance the yellow colour of the elastic tissue was exposed. Virchow's examination discovered only irritative processes, and, among proliferating epithelia, a single nest of concentrically arranged epithelial cells. He then, in conversation, said that the case might be one of *psoriasis laryngis*. There still remained the objection that the piece removed and examined might not be of the actual substance of the tumour. Mackenzie therefore endeavoured to obtain another test object. On the evening of the 23d of May, at Potsdam, he made another attempt with strong, sharp forceps. I saw how he drew the forceps from his breast pocket and inserted it without any previous closing, and how, while it was inserted, the illuminating stream of light thrown by a mirror on his head to the mirror of the laryngoscope deviated laterally and fell upon the cheek of the august patient, instead of into his mouth. The forceps came back empty. Mackenzie would not again operate that day. I examined immediately after him, and found both vocal cords strongly reddened, the right cord swollen with blood over its whole extent, and on the margin of the right cord, anterior to its centre, a blackish red swelling projecting into the glottis. I requested Surgeon-General Dr. Wegner, without further mention of the accident, also to examine. He did so, and said that he could see nothing. We went to Mackenzie's room, and I there told him positively that, instead of the left vocal cord, he had seized and pinched and wounded with his strong forceps the right cord, which was previously healthy. He said, 'It can be,' and then spoke of speedy departure. We said that he must at least remain that night in Potsdam, and Surgeon-General Dr. Wegner mentioned the name of a military surgeon in Potsdam who could assist at the tracheotomy which might possibly be required.

"The august patient was from this time and until he had been somewhere in England voiceless, and suffered during the next days from pains in both sides of the neck, with some constriction. This appears to be the first certainly authenticated case in which a laryngologist by inadvertence attempted to take away a portion from the sound vocal cord. The august patient, who was previously hoarse, but who had never been voiceless for more than three hours, now remained voiceless for many weeks—namely, until the 8th of July; and it was subsequently praised in England, as a triumph of surgical skill, that his hoarse voice had returned. On the 25th of May there was another large consultation, at which Drs. von Bergmann and Tobold convinced themselves that the right cord had been injured near the middle. The injury was visible on the 28th, but he changed its appearance because the redness of the right cord had subsided, and the injured spot appeared as a blunt-pointed yellow elevation on the vocal chord. On the 1st of June there was a loss of substance on the right cord, about three or four millimetres long, and one or two millimetres broad, that seemed covered with yellow pus. According to Landgraf's report, the injury might be considered to have healed on the 29th of June.

"On the 24th of May Dr. Wegner and I were in

consultation with Mackenzie at Potsdam. In certain circles it was already generally known that he had promised the family of the ailing patient completely to cure the disease in a few weeks without external operation. To the surgeons in attendance he had said the word of this. I pressed him the same evening, in my room, to communicate his plan of treatment. He declared, and Dr. Wegner noted down, that the growth must be removed with sharp forceps, and then the galvanic cautery applied; or that the same end might be attained by the continued use of the galvanic cautery. He preferred the former method, by which in some time the voice would be perfectly restored. To my question whether he could state this with certainty, he replied, 'Yes, certainly,' and added, after a pause, 'humanly speaking.'

"On the 25th there was another great consultation, at which all consented that Morrell Mackenzie should remove the growth with sharp forceps and hot wire, since he asserted that he could do this, and that the voice would again become 'loud.' His assertion sounded somewhat less positive than on the day before. Von Bergmann on this occasion declared expressly that he believed the growth to be a malignant new formation; and Tobold expressed the fear that it might not be possible to remove the whole of it with forceps, and that the external operation might afterwards be required; and he gave a caution against repeated operative attempts, by which the growth of the tumour might be accelerated. I said I had not believed that the tumour could be removed through the month, but that, as Mackenzie asserted it could, he might make the attempt, but only until the growth, either by the removal of a fresh portion or by its course, was shown to be malignant. Morrell Mackenzie declared voluntarily that he would proceed in the manner described until another piece was shown after removal to be malignant, or until the tumour increased.

"From the 25d, in accordance with Mackenzie's wish, Surgeon-General Dr. Wegner daily insufflated a powder of morphia, bismuth, catechu, and sugar, and the cancer increasing, and it was sprinkled with a harmless powder. Mackenzie's declarations were on all sides firmly believed. It is a peculiarity of laryngeal cancer that it remains for a long time a local malady, and does not affect the appearance or strength. All the world rejoiced at the healthy appearance, the strength and colour of the exalted patient; and any one who said that the disease was slight, and free from danger, obtained the applause of all those who were not in a position to be acquainted with the facts.

"On the 1st of June I made a careful examination for the last time. The growth was larger, still emporing on the inner side, posteriorly more deeply defined against the vocal cartilage, and here the inequality and erosion, as I distinctly saw, already passed over to the posterior wall. The left vocal cord, as before, was less movable than the right. Pain returned from time to time, but there was no sensation of choking. Dr. Morrell Mackenzie, who in the meanwhile had gone to England and returned again, removed on the 8th of June, at Potsdam, two more particles of the growth. He knew this time how to keep away from the operation so inconvenient an onlooker as myself. The examination of Professor Virchow showed an increased formation of epithelium, combined with papillary outgrowth (improperly called papilloma)—*Pachydermia cervicosa*. He added, however, that a judgment upon the character of the mass of the disease could not be based with certainty upon the few extirpated particles. The opinion which these words contained was made known at a large consultation on the 10th of June, and, at Mackenzie's wish, was published. At the same consultation it was expressly declared by Von Bergmann that climate exerted no influence upon such diseases.

"Mackenzie asserted that the climate of the Isle of Wight was calculated much to expedite the cure. All our words were fruitless. The journey to England was a settled thing; but only Mackenzie knew how the conclusion had been arrived at, not one of the other doctors. In a consultation at the Hotel de Ville, Dr. Wegner's on the 1st of June in which his Excellency Von Laener, von Bergmann, Schaefer, and Tobold took part,

it was concluded that, as the journey was not to be hindered, two wishes should be formally expressed—the first, that all pieces of the growth which might be removed should be submitted to Virchow for examination; the second, that the treatment while in England should be under the control of a German surgeon skilled in laryngoscopy.

"At this time the general opinion both in the medical profession and among the laity inclined to the conclusion that the 'German doctors' had erroneously assumed the disease to be cancer, and had proposed an external operation dangerous to life, and that Mackenzie, by his promises, had preserved the ailing patient from this operation, and had thereby saved his life. The whole influence of the Press was employed for the establishment of this view.

"What could the growth be if it were not cancer? According to Mackenzie, it could at no time be cancer; and at different times he described it, as a wart-like cancer, or as a papilloma, as laryngitis, as perichondritis, or as laryngitis and perichondritis. On no occasion did he ever give us a clear, tenable diagnosis, and was only consistent in his denial of cancer. The grounds on which he disputed the diagnosis of cancer were as follows—First, the growth did not look like cancer. Such an argument cannot be dispensed. Secondly, it was necessary that a portion should be shown to be cancer by the microscope. For diseases the causes of which are clearly known, and are necessarily present in every particle or microscopic section, such a contention may be completely justified, as in tuberculosis, actinomycosis, and in cancer, in which the blood in cases of splenic or of relapsing fever is generally known that no analogous cause of disease has yet been discovered. The highly meritorious attempts to discover such a cause, a lymphatic cancer, have not yet resulted. We stand to-day with the diagnosis of cancer much where we were at to tubercle prior to Koch's discovery of the bacillus. A tumour, as in the classic case recorded by Virchow in his work on tumours, Vol. ii., page 349, may consist of a great part of harmless proliferation tissue, and only a small portion of cancer; yet, as in that case, the progress, even when the growth is anatomically regarded as benign—e.g., as a fibroma—may show its malignancy. Still more frequently is cancer surrounded by small benign proliferations. Virchow has fully borne this in mind by saying no more than that the portions examined by him contained no cancerous tissue. Mackenzie considered, and incorrectly, that Virchow's results as affording proof that the entire growth was benign. So, on the 1st of June, he wrote to the editor of the *Deutsche Zeitschrift für Medicin*, that he was very glad to be able to inform you that by the microscopic examinations of Professor Virchow it is now completely established that the disease is not cancer.' He must have known that Virchow might possibly have examined no more than lateral projections of the growth, and that a cancerous nucleus might be present. The course of the disease had been clearly described to him, and deserved consideration which it did not obtain.

"When, at the last consultation, we said to Mackenzie, 'The growth has increased, it already involves the posterior wall, the left vocal cord moves imperfectly,' he said slowly than the right,' he replied, 'I do not see it.' He himself afterwards wrote, in a report published in San Remo, that the diminished mobility of the left cord had already been established in Berlin. Might he, after all, have already have seen it in Berlin?

"For some time the assumption was spread abroad that the disease in question was not cancer, but 'pachydermia verrucosa laryngis.' This assumption rested upon Virchow's examination of small pieces of the growth. From this name not much had been gained since the clinical history of the malignant disease does not differ. Neither in Virchow's work on tumours, nor in Mackenzie's on diseases of the larynx, nor in any other, can a word about it be discovered. All that has hitherto been written on the subject is contained in a dissertation by Hnemann (Berlin, 1881), which, like the subsequent paper by Virchow, gives positive information only with regard to anatomical considerations. Moreover, on the three following grounds the suggestion may be rejected:—

1. Pachydermia is absolutely as occurs almost all the time. 2. The disease was originally suggested by me. 3. The disease was described at the meeting of the Society on March 23 of this year. 4. The disease was confined to one side for months. 5. Pachydermia is a malady of slow progress, while in the case of the Crown Prince the progress was rapid from the first.

"Lastly, the suggestion of Mr. Lennox Brown should here be noticed, to the effect that the disease was originally benign, and that it had been rendered malignant by irritation, especially by my use of the galvanic cautery. This is a fine example of transformation is a matter of faith with a few. The extensive statistics of Dr. Felix Semon have shown that out of 8,300 cases of benign tumour only 4 were found to have undergone malignant transformation. It is probable that in these figures the statistics are free from diagnostic error, not of true transformation.

"In every case a small new formation of undetermined character, based upon a vocal cord, the duty is to remove it. What surgeon would look on with folded arms, and allow the growth to increase, only for fear it might become cancerous? If the new formation is destroyed, and grows again with alarming rapidity, one must, of course, not delay to open the larynx, so as to render the growth accessible and to destroy its root and branch. Dr. Lennox Brown ascribes to the galvanocautic the quite peculiar property of converting a polypus into cancer more than to Dr. Mackenzie's forceps, which subsequently inflicted a severe injury on this very larynx. Suppose it were established that benign tumours of the larynx underwent transformation into malignant ones in any appreciable proportion, even in the half per cent, which might appear from Semon's statistics, it would still have to be shown that any kind of treatment could exercise any influence in curing or retarding the change, and yet again, that any such influence was exerted in the present instance. The assertion thus brought into publicity is thrice unfounded.

"THE JOURNEY TO ENGLAND.

"The journey to England, having been planned without the knowledge of the surgeons in attendance, and having been decided upon in opposition to their advice, was stated by Mackenzie, when the matter was discussed in consultation, to be intended for the purpose of obtaining the benefits of the air of the Isle of Wight in promoting the cure of such laryngeal disease. The positive declaration of Von Bergmann that climate exercised scarcely any influence upon the progress of such cases, and that either a benign or a malignant tumour of the larynx could be as effectually cured in Germany as in England, was met by Mackenzie with a simple denial. The result showed that the climate of the Isle of Wight no little promoted the recovery that Mackenzie himself took occasion to remove the august patient to Scotland. The air, also, of Töbiash, of Bavaria, or of San Remo could neither do harm nor good to the disease.

"In the face of the determination arrived at, a consultation, held on the 1st at the house of Surgeon-General Dr. Wegner, and attended by Von Lauer, Wegner, Schrader, Von Bergmann, and myself, expressed the wish—

"1. That there should be supervision by a German surgeon skilled in laryngeal surgery.

"2. That the treatment by Dr. Mackenzie should be continued, as he had consented, until the growth was shown to be cancerous, either by the microscopic examination of a portion or otherwise. On this account, that portions subsequently removed should be sent to Vienna for examination.

"With regard to the first point, I had been, by command of the august patient, requested a few days previously, by his Court Marshall, to accompany him to England, and naturally intended to obey this request. I only made the request that Surgeon-General Dr. Wegner should also be in attendance.

"On the evening of the 5th of June I was informed that the arrangement was altered, and that only Dr. Wegner would accompany the patient as a medical

REMARKS.

"On the same evening I pressed in the strongest way the conclusion arrived at in the consultation, with the result that Dr. Wegner sought and obtained the co-operation and support of Staff-Surgeon Dr. Landgraf. In this way the supervision so much to be desired was apparently secured.

"Upon being informed by the Surgeon-General that he must forbid Herr Landgraf to write letters to me on the subject of the progress of the Crown Prince's disease, I abstained from holding any conversation with Dr. Landgraf, my assistant, on this subject, and he was informed by Herr Wegner of the nature of his duties and of the previous history of the case. The last word that his Imperial Highness spoke to me was friendly and gracious, and referred to the change made with regard to his medical travelling attendants. The first official report of Dr. Landgraf from England, which was shown to me by Herr von Lauer, confirmed, although I had not said a word to Dr. Landgraf on the subject, what I had seen on the 1st of June, with the small and intelligible exception that he saw no wound on the tumour. Landgraf's report set forth, on the 18th of June, 'The right vocal cord is reddened, somewhat swollen, and exhibits opposite the tumour a small excitation. On the left cord there is a conical or pointed tumour, with broad base, directed upwards and backwards, which occupies about the posterior third or fourth of the cord. The tumour is of a pale yellowish-red colour, with no remarkable redness either of the tumour or in its vicinity. The mucous membrane of the anterior part of the posterior wall of the larynx is thickened, and the adduction movement of the left vocal cord seems somewhat slower than that of the right. In phonation an opening remains in the glottis. No ulceration. Complete loss of voice.'

"On the 17th, Mackenzie had sent to Herr Wegner the following account, which was officially reported:—No congestion, condition favourable. He remarked no defect on the right vocal cord, and explained the voicelessness as being due to the projection of the swelling of the left vocal cord, which prevented the two from coming together. Landgraf, with the above-mentioned exception, had seen all that I had pointed out on the 1st of June, which Mackenzie then could not see, and which in England he expressly denied seeing—namely, the redness of the right cord, the irregular form of the margin of the right cord, the encroachment of the disease upon the posterior wall of the larynx, and the impaired mobility of the left cord.

"On the 26th of June, Landgraf found the mucous membrane of the upper part of the laryngeal cavity appearing paler than before, and so with the right vocal cord, the defect in which was still visible. The tumour of the left cord had rather increased than diminished in circumference, and was no longer conically pointed, but rounded. Between the tumour and the anterior surface of the posterior wall of the larynx there was much mucus. The mobility of the left vocal cord slower, as on the last occasion. After this, yet another report by Dr. Landgraf was sent to me by Herr von Lauer.

"On the 1st of July Landgraf found, after Mackenzie's operation on the tumour of the 28th of June, the interior of the larynx reddened, the prominence on the right vocal cord and the tumour on the left not more visible, but on the posterior wall a more distinct swelling of grayish yellow colour. This Landgraf saw on the 1st of July. Only much later Mackenzie's attention was first directed by his assistant in the Isle of Wight to a thickening of the mucous membrane on the posterior surface of the arytenoid cartilage, and then he saw it. (*Berliner klinische Wochenschrift* of the 21st of November, 1887).

"From this time I received no further communication upon the progress of the disease.

"After the consultations of the 9th and 10th of November, Sir Morell Mackenzie declared publicly:—

"Although the nature of the last occurring new formation cannot certainly be determined, yet it presents entirely the aspect of a cancerous formation.

"REPORT OF PROFESSOR AND MEDICAL PRIVY COUNSELLOR DR. E. VON BERGMANN.

"On the evening of the 15th of May, 1887, I received a summons from Surgeon-General Dr. Wegner, Surgeon in Ordinary to his Imperial Highness the Crown

Prince of the German Empire and of Prussia, requiring me to examine his Imperial Highness on the following day, in conjunction with Dr. Wegner and with the Medical Privy Councillor Professor Gerhardt, and to report upon his case. At the same time, Wegner informed me verbally of the history of the august patient's malady; and also that the summoning of a surgeon was the late express wish of Gerhardt. I agreed with Wegner in what in so highly important a case he thought necessary, that another specialist of renown should be called in; and the more since I am by no means a specialist in laryngeal maladies, nor skilled in endo-laryngeal operations. As we were agreed that Gerhardt himself held the first place among German laryngologists, it was natural to think of some foreign authority. I named first Professor Rauehuss, of St. Petersburg, or the two esteemed laryngologists of Vienna, Schrüfer and Störk. Wegner replied that Mackenzie, of London, to whose work on diseases of the throat and nose, then lying before him, he pointed, seemed to him the most suitable; and I at once assented. My examinations were made on the 16th and 18th of May; but even in the first examination I obtained complete certainty of the presence of an epithelioma on the posterior portion of the left vocal cord. In consequence I declared at once for the external opening of the larynx; since, on the assumption of the presence of a small carcinoma in the larynx, I should unhesitatingly prefer this method to an endo-laryngeal operation. Whatever may be said of thyrotomy, or incision of the larynx, made in order to operate in the interior of the organ, so much is certain, that during the last 10 years the operation has been performed with constantly increasing frequency and with constantly diminishing risk. Of seven incisions of the larynx which I have performed in Berlin, and to which two cricotomy must be added, not one has had an unfavourable issue, all have healed quickly and without complications. (The *Fall* *Mail Gazette* and the *Vossische Zeitung* have constantly represented me as a surgeon in whose hands a laryngeal operation has not been successful. 'Dr. Von Bergmann has not performed even one.' From Mackenzie I have not withheld my favourable results.) I am not alone in regarding the operation so favourably, many others, as Rauehuss for example, and Kohler, are of the same opinion; and the last published work of Schuchardt, from Volkman's clinic, 'On external division of the larynx,' says, 'The danger to life of opening the larynx was formerly exaggerated, and is very small under antiseptic treatment.'

"In such circumstances, it is intelligible that I should recommend the opening of the larynx in all cases in which there is well-grounded belief in the presence of a malignant growth in the interior of the organ. In the hitherto published volumes, for four years, of the 'International Centralblatt für Laryngologie,' 15 cases of opening the larynx are recorded—that is, of thyrotomy and cricotomy. One of the patients died in consequence of diphtheria; all the rest afforded good results.

"It is a serious error to attempt to estimate the value of an operation by putting together the results of all the cases which can be found scattered through the journals. Such statistics afford material only for the consideration of each special case from which they are derived. If we take a series of them, either of extirpation of the whole larynx, or of a portion of it, they teach the same lesson as the history of other extirpations of malignant growths, or as the history of abdominal and intestinal resections. Surgeons have at first regarded the new operations with too great hopefulness, and have consequently given them too wide an application. But in this way sufficient experience has comparatively soon been gained, and the result has been to diminish the number of operations, but to increase the chances of success. The recoveries from total or partial extirpation of the larynx have all been in cases in which the disease had existed for a relatively short time, and had not widely extended. It is therefore intelligible why the percentages of recovery, after the extirpation of half, or of some smaller portion, of the larynx, should be larger than after extirpation of the whole. The growth to be removed was in the former cases smaller than in

the latter. Since, in our vocal cord of the august patient, appeared to us that the op-

prospects. This view was which, however, was first Brannan's microscopic exam-

the tendency to horny induration of the epithelial cell in the cancerous bodies of the growth. These indurated caneroids, as is shown by the cases of Hahn and Schede, are those which justify the most favourable prognosis.

"Of any other operation than the opening of the larynx for the removal of a small growth situated on the lower surface of the left vocal cord, there is, in my opinion, no suggestion. This only I must emphasize this statement, because the Press have constantly spoken only of the larynx, and, in respect of English and German journals, even of Mackenzie as a man who had resorted to the hands of the surgeons. We recommended was not more than a monotracheotomy; which, according to our diagnosis, the Crown Prince must in the future inevitably have to undergo. We therefore only recommended what was indispensable.

"But what is the interpretation, the commentary, which I am having at that time pressed decidedly for that operation has until recently called forth I stood upon the basis of my own positive experience. Two years had then elapsed, now therefore more than three years, since I opened the larynx of a man 42 years old, and removed a laryngeal cancer together with a portion of cartilage. This patient whose name is Cygan, stands beside me while I write and has ever since remained well, and without relapse. He is an illustrious author, a member of the German printing office, and although his name is known it is perfectly intelligible at 10 paces distance. As the examination of his larynx affords a very interesting mirror image, and is well calculated to show how far the right vocal cord in phonation will cross the middle line, in order to approach the glottis, which lies on the left, I invited Mackenzie to inspect him but unfortunately the demonstration did not take place. The case resembles one which was reported by Sol Cohen in the *Medical News* of 1887. It is, a patient with cancer was treated twenty years before with permanent good result by opening the larynx, the same operation which I advised for our august patient. In my case, the tumour removed was examined and declared to be cancer by me, by my assistant Fehleisen, and by Professor B. Frankel, whom I have to thank for sending me the patient. This gentleman has submitted his preparations to Professor Waldeyer, who has expressed his agreement with our microscopic diagnosis. Besides Hahn, in whose well-known English case of M. M. W. Puget made the anatomical examination, there is a third Berlin surgeon, Professor Kuster, who has obtained a permanent cure by the removal of a cancerous growth by partial laryngeal extirpation. The patient who was operated upon seven years ago, is Sanfte Privy Councillor Fromm, of Norderney, whose I speech has never for a moment interfered with the discharge of his duties.

"Suppose, however, that we had been in error, and that we had found no cancer, but a benign new formation, no injury would have been inflicted upon the august patient by the operation, and the diagnosis question by Mackenzie would have been cleared up at the right time. It is true that thyrotomy has its dark side, the disturbance of the voice formation; but this is not a constant consequence. Rauehuss, Bennett May, Park and others have performed the operation in order to remove multiple papillomata from the vocal cords of children, and the voice has been well retained. Schüller correctly says in his monograph on tracheotomy and laryngotomy that it is the seat and nature of the growth to be removed, not the thyrotomy, which generally determines the phonetic result. It is possible, as the statements and precepts of Schuchardt and Kohler show, to avoid any deviation from the middle line by careful, accurate, and foreseeing management of the incision,

...clearly, when, as in my case, the operator marks out, with a short, strong knife, the incision which is to be completed by the cutting forceps.

"The opening of the larynx, such would have neither imperilled life nor impaired the voice, although the latter must be injured by the removal of the growth, equally whether this was within or beyond the limits of the mucous membrane. In this respect the internal does not differ from the external operation. It was unavoidable that with the tumour, if it was to be removed, a piece of the vocal cord must be removed also; the method of removal, whether from within or from without, made no difference in this. I had therefore to declare that the operation which I advised would be permanently injurious to the voice. It would leave a hoarse, raw voice, but this, as the right vocal cord would be preserved, would be sufficiently intelligible. I was in a position, by reference to persons known to his Imperial Highness, to indicate the sort of voice which would be retained."

"I think I have to thank these representations that, after our second examination on the 18th of May, her Imperial Highness the Crown Princess directed me to make all preparations for the operation, so that, as soon as Mackenzie had arrived, and had expressed his agreement with our opinions, the operation might be performed on the next morning—that is, on the morning of the 21st of May. The august patient himself said to me, 'The growth must be removed in any case. If it cannot be removed from within, you must cut from without.' I assented, and devoted myself to the preparation of apartments on the second floor of the Crown Prince's palace, which were emptied and arranged into rooms for the operation itself, the subsequent convalescence, the surgeons, and the attendants. Her Imperial Highness the Crown Princess assisted in these arrangements in the most indefatigable manner, that not the smallest thing should be forgotten, and that everything which I declared to be necessary should be new and clean. On the evening of the 20th of May, the operation table, the instruments, and the sterilized bandages were all in their places."

"It is well known that Mackenzie's determined opinion rendered all these preparations and arrangements of this sort of the subject I have little to add to the account given by Privy Councillor Gerhardt. How unequivocally Mackenzie reprobated my strongly pronounced diagnosis of cancer may be gathered from his having said to me, 'I am convinced that, were you not dominated by your interest in the beloved Crown Princess, were he an ordinary patient in your clinic, you would not think of cancer in the case.' It was also evinced by his over and over again repeated assurance that his large experience had shown him more than one absolutely identical case which had been quickly cured by mild and gentle endo-laryngeal treatment. It was further shown by his assurance to several gentlemen of the household that in a few weeks after treatment in England the Crown Prince would recover his old voice, and would certainly be able to take the command of the autumn manoeuvres. The form in which this assertion was made was the same as that which appeared in the World paper of the 23d of November, 1887, where Mackenzie's words are given as follows:—'At present I still think that at that time the affection was not malignant. What I saw in the larynx of the Crown Prince appeared to my eye not to be cancer; and I may fairly claim to have seen more of such cases than any other person living.'

"I will not pass without notice my objection to Mackenzie's utilization of Virchow's report of the 21st of May. It is only in very few, I may say, in exceptional cases, that I have obtained any help in my diagnosis from such observations; and it is a matter of chance whether, from an organized tumour such as carcinoma, a characteristic place can be obtained or not. Virchow himself has stated this in more than one place in his esteemed work on tumours, as well as Page Lücke, and Mackenzie himself, whose words are, in his book, 'Growths in the Larynx,' London, 1871, page 36:—'In cases in which particles are coughed up, or are removed by the aid of the laryngoscope, the microscope cannot be relied upon for the purpose of a differential diagnosis. I have known many cases in which the histological appearances were decidedly those of cancer, while the clinical progress

was of a totally opposite character, and vice versa.' Still more recently, Virchow—'I will say nothing against this kind of examination, which is often the only one possible; but one cannot be surprised when its results are deceptive. How easily may it happen that the minute parts which are at the disposal of the microscopist do not belong to the bad place.' In the case before us it was scarcely possible to reach the part of the growth in which characteristic elements might be present, since the growth was on the under surface of the vocal cord, and possibly commenced on the lateral wall of the lower laryngeal space. This position rendered the removal of portions intended for examination illusory, as Mackenzie also admits on page 347 of the German translation of his book on 'Diseases of the Throat and Nose'; and for this reason Gerhardt and Tobold declined the attempt. Mackenzie ascribed another motive to them both, as is shown by his communication to the *Pall Mall Gazette* of May 17, 1888:—'There are two German professors present, specialists in throat diseases, both of whom declared themselves incompetent to undertake an operation which any member of the staff of the hospital for diseases of the throat in London would immediately accomplish, and which any student after a year's instruction would perform with facility.' Mackenzie applied his forceps to the upper surface of the vocal cord, and must therefore have gone through the whole thickness of the cord in order to arrive at the basal part of the growth in question. That he did not succeed in arriving at it is sufficiently shown by Virchow's description of the detached portions. I can arrive from Virchow's description at no other conclusion than 'non liquet.' The information upon the anatomical formation of the piece submitted to him did not afford material for a definite conclusion, still less for that which Mackenzie and his supporters in the *Press* drew from it, and which is formulated in the following quotation from the *Pall Mall Gazette* of June 15, 1887:—

*"With reference to the pessimistic reports which several London morning papers have received by telegram from Berlin concerning the throat disease of the Crown Prince, the *Pall Mall Gazette* yesterday sent a representative to Dr. Morrell Mackenzie, in order, if possible, to obtain a denial of the sensational rumours. Dr. Mackenzie gave the contributor of the *Pall Mall Gazette* the following information:—After the first portion of the growth was removed, Dr. Virchow declared that he must have a further portion for examination, but he afterwards told Dr. Wegner, the Crown Prince's surgeon in ordinary, that he was entirely satisfied. The first examination gave only a negative result. No cancerous ulcer was discovered, nothing but the products of inflammation. By the second operation, which Dr. Mackenzie performed after his return to Berlin, a much larger portion was removed. Virchow was enabled to pronounce a positive opinion, in which he described the growth as a "thick-skinned wart." This is the common form of warty growth in the air tubes. Dr. Mackenzie added that as regards the nature of the growth he had not assumed, and would not assume, any responsibility. For this he regarded Dr. Virchow as wholly responsible. At the same time he was convinced that there was nothing in the throat which had the appearance of a cancerous ulcer."*

The British Medical Journal had previously expressed itself in a similar manner, although it had been corrected in our sense by Butlin, who wrote in the number for the 4th of June:—

"The chief points to which I would allude are the results of the microscopic examination of a fragment removed with the forceps, and the manner in which our journals (particularly some of the daily journals) have spoken of the triumph of British over German laryngeal surgery. Since I directed attention to the importance of the removal and careful microscopic examination of fragments of questionable laryngeal growths in 1883 ('Malignant Diseases of the Larynx,' pages 28 and 43), I have enjoyed numerous opportunities of examining such fragments, both in my own practice and in that of others, and I have learnt how misleading and dangerous it is to rely on the examination of a single fragment, unless the appearances are pathognomonic of such a disease as squamous-celled carcinoma (epithelioma), if the structure of the fragment is of doubtful import,

or such as one might find in inflamed tissues, it is essential, before a decided opinion can be expressed, that a second or even a third fragment should be removed and examined. One or two cases recently reported have shown the immense importance of this caution, and the blunders which must have resulted had it been neglected. In the case of the Crown Prince I understand that the fragment which was removed was very small, scarcely removed with difficulty on account of the surrounding swelling. I have every respect for the marvellous manipulative skill of Dr. Morell Mackenzie, but I also know how impossible it is under such circumstances to select with anything approaching certainty such a fragment as is well fitted for examination. We must admit the superiority of Professor Virchow in microscopic anatomy; but, after all, he can only express an opinion on the structure of what has been submitted to him for examination. The question is at present in a very unsettled condition; and some, if not many, of us here feel the gravest apprehensions regarding the real nature of the ailment of the Prince. The occurrences of the past few days do not afford the least proof that Dr. Mackenzie is right and the German physicians are wrong; and I do hope that our journals, whether lay or medical, will refrain from any expressions of triumph until we are in a position to know that Dr. Mackenzie has really well upheld the credit of English medicine abroad."

"In the same manner Felix Semon expressed himself in a similar manner.

"Notwithstanding such expressions of opinion from many of our German and British professional brethren, the report was not forwarded to a sense different from that which he himself, at the meeting of the Berlin Medical Society on the 16th of November, 1887, attached to it; and, moreover, the unfortunate coincidence in point of time of Virchow's paper on "Ecdyodermis larynx" of the 27th of June gave occasion to be believed the more so since a phrase in his opinion of the 20th of June might create the impression that the pathological anatomist had gone beyond the limits assigned to him, and had not confined himself to an opinion on what was laid before him, but that he had brought his conclusions into question, and that he had been observed by the clinical physician, and had therefrom arrived at a conclusion concerning the whole of the disease. I refer to the statement in the second column of page 445 of the *Berliner Klinische Wochenschrift* where it is said, "They characterise the disease (which can hardly be interpreted otherwise than as the whole) as an epithelial proliferation combined with papillary outgrowths." What Virchow really thought and believed he set forth at the meeting of the Berlin Medical Society on the 16th of November, 1887.

The progress and tragic ending have shown to what extent the opinions of Butlin and of ourselves were well founded.

"After our last consultations with Mackenzie we entirely lost the confidence in him which had led to his being summoned. We were brought to this, first through the inextricableness of his manipulation in the larynx, which gave us not the least assurance that his instruments had been applied to the growth and not to some other part of the larynx; as, for instance, the notoriously badly wounded right vocal cord; secondly, by his unscientific and arbitrary interpretation of the report, in direct opposition to his own doctrine, as well as by his endeavour to shift all responsibility upon the pathological anatomist; thirdly, by the way in which, from the moment of his entry into Berlin, the Press got hold of information concerning the illness of the august patient. Mackenzie received a series of correspondents and issued a series of telegrams to English papers, which was here officially ascertained. The first journals which used the words 'cancerous' and 'malignant growth' were English, and were the *Daily Telegraph* for the 24th and the 25th of May, 1887, in their correspondence from Berlin, dated from the 21st and 23d. The last mentioned number first extolled, in the way so often done afterwards, Mackenzie as the preserver of the Crown Prince from a dangerous and useless operation, and the following number, for the 26th, announced the approaching complete restoration of the voice of the Prince. In the same paper, on the 28th, was so good as to excuse

the anxiety of the German doctors for a weaker national character. That the *British Medical Journal*, of the 28th of May, did not hesitate to name the disease has already been shown by the quotation from Butlin. We may thank the German journals, both medical and political, that they were not the first to use and to multiply this ominous name. The *Berliner Tagblatt*, which afterwards abandoned all respect for us, wrote towards the end of May only of an inflammatory inflammation on the vocal cord. How afterwards the enthusiastic partisans of Mackenzie in Germany could charge Gerhardt and me with having 'published our diagnosis,' or even with having been 'induced by vain-gloriousness to announce it far and wide,' is to me unintelligible. Many of our colleagues would have done better if they had mastered the facts before they addressed letters and exclamations to the papers.

"On the 24th of May, and therefore prior to our general consultation on the 26th, a consultation was held between the surgeon in ordinary, Surgeon-General Dr. Wegner, and Mackenzie, in the New Palace (Schloss Friedrichskron) at Potsdam, in which the former drew up a protocol, to which Mackenzie assented. This has been preserved in the archives of the Royal household (No. 4,028), and it runs:—*Dr. Mackenzie is of opinion that this form of swelling the first thing to do is to remove as much as possible by cutting forceps, and then to destroy the remainder by the galvanic current. Dr. Mackenzie declares it to be certain that by this means he will be able after a time so to restore the voice that it will again be loud. In the interval mild astringent powders were to be applied to the swelling. Dr. Mackenzie is further of opinion that the application of the forceps is not absolutely necessary, and thinks that the treatment by galvanic cautery might be equally effectual. With regard to the nature of the swelling, he believes it, according to Virchow's examination and declaration, to be benign, and that it may be cured by internal (that is, intra-laryngeal) treatment.*

"In the protocol prepared by Wegner of the medical consultation of the 25th of May, and also deposited in the archives, Dr. Mackenzie *believes the tumour to be, according to its distinguished history and to the foregoing declaration, an inflammatory thickening, and thinks that this, such, cannot become cancerous. Should the tumour continue to increase, it must, in the first place, be removed by forceps. If this should not succeed, and if other endo-laryngeal treatment should also be fruitless, then opening of the larynx must be resorted to.* To this we attached our opinions, mine and that of Gerhardt being nearly identical. After Wegner's protocol and the document of the Household Minister, the latter reads:—*Although he does not believe that the growth can be removed through the larynx, yet he so far yields to Mackenzie's opinion, that he can do this, that he assents to his proposal, but only so long as neither an examination of the structure nor the course (that is, the inevitable increase) of the tumour should render another plan necessary. In the memorandum written by me on the same occasion, it is stated:—*I expressed a fear lest too long a delay in the extirpation of what I certainly considered to be epithelial cancer would allow it to attain a size which would interfere with the success of our contemplated operation from without.*' Mackenzie replied that the external operation would seriously prejudice the recovery of the voice; while his proposed repeated pinching off afforded greater probability of the preservation of the vocal function. Professor Tobold added to the protocol:—*I consider the method of removing the growth by squeezing forceps to be inappropriate and impracticable, since it must be impossible to remove sharply and cleanly in this manner a new formation difficultly connected with the vocal cord. It must be feared that recurrence would take place before long, apart from the consideration that, according to my experience, the rough handling of the cord and of the growth which must be inevitable with the application of forceps, will promote, especially if the growth should be malignant, a tendency to renewed proliferation, and lead finally to the necessity for a more exact procedure. I hold the only proper course to be the opening of the larynx, so that the growth may be completely exposed and removed with certainty, all diseased parts being cut away, and the sur-**

face burnt with by urine's caustery. Even for the voice a better result is likely to be attained in this way than if, by the application of squeezing forceps, we leave an uneven, torn, and lacerated vocal cord.

"On the 1st of June, at a conference of the surgeons Von Lauer, Gerhardt, Von Bergmann, Tobold, Schrader, and Wegner, we were first informed by the body surgeon of His Majesty, Staff-Surgeon-General Von Lauer, that the Crown Prince would follow the physician consulted by us to England, and that His Majesty had consented to this course, provided that measures for controlling the treatment could be concerted by the Berlin physicians. In the protocol appears:—

"He had been asked by the House Marshall of his Imperial Highness, Count Radolinski, whether he would accompany the Crown Prince, and that he had expressed his readiness to do so."

"How at the last moment it was arranged that Gerhardt's attendance should be declined has never been cleared up. We most urgently demanded that he should go, and we asked the surgeon in ordinary Von Lauer to report in this sense to His Majesty. I had hoped that Gerhardt's presence would secure the observance of the stipulations, agreed to by Mackenzie at his second visit to Berlin, namely—

"1. That every piece removed should be sent to Virchow."

"2. That an increase of the growth should lead to the opening of the larynx."

"It is notorious that these stipulations were not kept. The piece sent from Norwood was described by Virchow himself as a "superficially excised fragment of mucous membrane," which did not permit the formation of any further opinion as to the condition of the deeper parts; while the distinct growth of the tumour was observed from week to week by Staff-Surgeon Dr. Landgraf, who, as assistant for the laryngoscopic examination of the august patient, accompanied his body surgeon, Dr. Wegner, to England and Scotland."

STAFF SURGEON DR. LANDGRAF'S REPORT

DECLARES:—

"On the evening of the 12th of June, before my departure for England, in the suite of his Imperial Highness the then Crown Prince of the German Empire and of Prussia, I asked Privy Councillor Gerhardt for information concerning the illness of his Imperial Highness, and for indications concerning the part and duties assigned to me. Herr Gerhardt refused to acquaint me with his opinion upon the nature of the disease, and was not in a position to give me any instructions, but referred me to Surgeon-General Dr. Wegner, whose assistant I was to be, and whose directions I was to follow. The latter forbade me in Berlin to send home any communications. At Norwood he first made me acquainted with the previous history of the case, and informed me that his Imperial Highness had placed himself wholly under the care of Dr. Mackenzie, and did not wish us to take any part in the treatment. My function was, therefore, limited to the observation of the laryngoscopic appearances, and to the discussion of their significance with my superior."

"Upon other points calculated to assist in a judgment of the morbid process, such as the general condition, the loss or gain of weight, the existence of swelling of the lymphatic glands, the presence of pain in swallowing, and others, I could scarcely obtain any definite information."

"The results of the first examinations of the 17th and 18th of June have been furnished by Privy Councillor Gerhardt."

"Since Dr. Mackenzie is in opposition to my observation, denied the existence of inflammation, as well as the impaired mobility of the left vocal cord, and in a rough sketch which he made for Surgeon-General Wegner neither represented the defect in the right cord nor the swelling of the posterior wall, so that already a difference of opinion existed, I permitted myself, in the conviction that we ought to be informed concerning Dr. Mackenzie's therapeutic measures, to make the following suggestion on the evening of the 19th of June:—

"His Imperial Highness should be requested to consent that Dr. Mackenzie, whenever he made a change in the treatment, should communicate to Surgeon-General Dr. Wegner the special grounds of his treatment. I proposed to reduce every such communication to the form of a protocol."

"If Dr. Mackenzie's suggestion was declined by those concerned."

"During the next few days I heard that Dr. Mackenzie had been applying with a brush a solution of chloride of iron, and that his Imperial Highness had suffered pain after the application, which had been relieved by swallowing pieces of ice."

"Dr. Mackenzie stated that by these applications the swelling had been diminished."

"On the 24th of June I spoke of the importance of frequent examinations of the lymphatic glands for swelling, and discussed with a high presence in the Prince's entourage the chances of an external opening into the larynx."

"On the 26th of June I observed the condition already recorded by Professor Gerhardt."

"On communicating this observation, I learned that it was Dr. Mackenzie's intention to remove another portion of the growth for microscopic examination. This operation was performed by Dr. Mackenzie on the 28th of June, in the presence of Surgeon-General Dr. Wegner, but without any invitation to me to be present."

"I saw the results of the operation on the 1st of July. The growth had been removed. There existed considerable redness and swelling. The swelling of the posterior wall was more clearly visible. The surface of this swelling had a grayish yellow appearance. The swelling was almost central, but more developed towards the left side."

"Since Dr. Mackenzie confirmed only the first part of my observation, I felt considerable doubt of the accuracy of his examination, and this doubt I did not conceal. On account of the importance of the question, I requested that Dr. Mackenzie should be asked in writing whether he had seen the swelling of the posterior wall, and what significance he attached to it. I repeated this request on the 2d of July, when handing in drawings."

"It was declined to put the question in writing, but a verbal communication was promised on the first opportunity."

"On the 4th of July came the opinion of Professor Virchow, accompanied by a hopeful letter."

"On the 8th of July I found that Dr. Mackenzie declared the posterior wall to be healthy. I might here observe that, after I had pointed out to Dr. Wolfenden, at Norris Castle, on the 29th of July, the position in which I saw the swelling, Dr. Mackenzie, on the 31st of July, admitted its existence."

"On the 22d of July, at Norris Castle, I had the honour again to examine his Imperial Highness, after an interval of three weeks. I found the general redness and swelling somewhat less, especially on the ventricular bands. The right vocal cord was still very red, but less swollen. The left vocal cord displayed on its posterior two-thirds a broad saddle-shaped swelling. There was swelling and redness of the posterior laryngeal wall, no ulceration."

"The growth had, therefore, returned on the same spot from which it had been removed on the 28th of June. On the 23d of July Dr. Mackenzie admitted this himself."

"On the 27th of July I heard of the intention to return to the galvanic cautery. Before this was done I was permitted, on the 29th of July, to make another examination. The appearance was about the same as on the 22d. The movement of the vocal cords seemed to me better. His Imperial Highness spoke on this day with a distinct double-voice."

"On the 31st of July another examination was made by Dr. Mackenzie, and was followed by a long conference between him and Dr. Wegner. The latter reported to me the nature of this conference as follows:—

"He had told Dr. Mackenzie expressly that it was for him to determine the arrival of the time when he could do no more for the case, and when extreme measures should be resorted to. Dr. Mackenzie had said to him that he saw a ridge from the left vocal cord to the left

arytenoid cartilage (see my report of the 1st of July and added that there were three possibilities of an unfavourable issue:—

"1. That the least likely possibility was the passing of the disease into a malignant form.

"2. There might be a formation of multiple papillomata occurring in other parts of the larynx than that now affected.

"3. There might be a transition into chronic laryngitis, by which the deeper tissues of the larynx might be assailed.

"On the 4th of August her Imperial Highness the Crown Princess had the great graciousness to speak to me, and to inquire in the most affectionately solicitous manner about the health of her august Consort. I now learnt that, his Imperial Highness had suffered—since March—from pain in swallowing, and that he had only been free from it for a few days at Norwood. In the last few days it had increased, and there was difficulty of breathing in addition to the pain. I did not fail to point out the grounds which existed for serious apprehension, or the improbability of the explanation given by Dr. Mackenzie of the pain in swallowing—that it was local malady, a common *angina* from chill. I was unable to share the hope that a change of climate, from the Isle of Wight to Scotland, would exert any favourable influence on the malady.

"After, during the next few days, Dr. Mackenzie had applied the galvanic cautery, I found on the 7th of August the following conditions:—

"The tumour larger, extending more downwards, and of lumpy, uneven surface. Upon the centre there is a blackish spot.

"The swelling of the posterior wall of the larynx unchanged. There appears to be a ridge extending from the lower border of the tumour to this swelling.

"The left vocal cord almost immovable.

"The right vocal cord, which is less red and swollen, and in which the previously noted defect is plainly visible, comes right over to the tumour.

"I pointed out that the almost complete immobility of the left vocal cord was an indication of deeper changes.

"On this day Dr. Mackenzie himself admitted the paralysis of the left cord. On the afternoon of the 7th of August, when walking with Surgeon-General Dr. Wegner, I availed myself of the opportunity to point out to him that, so far, notwithstanding Dr. Mackenzie's prediction of complete restoration of health for his Imperial Highness, a period of eight weeks had been consumed in absolutely inefficacious treatment, during which time the malady, so far from having diminished, had become worse; and I strongly urged the desirability of a renewed consultation with German doctors as had at first been intended. I dwelt upon the danger of a yet longer postponement of the operation, and expressed the opinion that even now the removal of the growth might not be sufficient, and that extirpation of half the larynx might be required.

"The proposal for a renewed consultation was supported by Surgeon-General Dr. Wegner. The consultation, however, did not take place.

"Dr. Mackenzie, as I was told, admitted that there was no improvement, but said that all the cases of cancer which he had seen had presented a different appearance. If it were cancer, the growth would already be encircling. To the mobility of the left cord he had previously not attached much importance. Possibly it might even have been worse.

"This admission of the badness of his examination was not surprising to me. I had previously repeatedly expressed my doubts, as to the thoroughness of Dr. Mackenzie's examinations, especially when I was told that I required too much time for making a laryngoscopic examination.

"On the 9th of August we went to Edinburgh, and stayed there, and afterwards at Aberdeen, while his Imperial Highness, attended now by Dr. Hovell, proceeded to Braemar. Surgeon-General Wegner and I were commanded thither on the 23d of August, and there I had the honour of examining his Imperial High-

ness for the last time.

"The right vocal cord was less red than before.

"The left vocal cord neither moved in phonation nor in respiration. It remained in the middle position between the respiration and the phonation position. The surface of the tumour was covered by a series of small pointed outgrowths which reached nearly to the middle line of the larynx. By these growths the view into the deeper parts of the larynx was impeded, so that little could be seen of the ridge on the posterior wall.

"His Imperial Highness complained of continued pain in swallowing, and referred it to the left side of the upper part of the throat.

"Immediately after my examination Dr. Hovell asked me what I had observed. I could not see any renewed increase of the growth, but regretted that I was not in a position to impart, from my observations, and expressed surprise that he, who had far more frequent opportunities of examining, should ask me.

"After the return from Braemar I felt myself compelled to declare that, in my opinion, the morbid process was making steady progress for the worse. There then arose a discussion as to the significance of the appearances, in which it was maintained against me that the pointed outgrowths which I had seen might be remains of the old tumour not destroyed by the galvanic cautery. I considered that, to be new growths, and resented my opinion on this. That the tumour, as its greater projection into the glottis showed, had increased, and that it exhibited no signs of cauterization on its surface. I made the proposal that, if a renewed examination of a removed piece were held to be necessary, it should be strongly urged that this should be done without delay, as, in the present size of the growth, the cutting away of the piece required would be an easy matter. The same proposal I repeated on the 29th of August. On the same day I became acquainted with a bulletin intended for the *Reichsanzeiger*. This was drawn up by Dr. Mackenzie himself, and it denied the increase of the growth which I had with certainty ascertained, in the original draft the still continuing hoarseness received no mention.

"The bulletin was shown to me with an intimation that no alterations in it would be permissible.

"We soon after returned to London, and his Imperial Highness dismissed us very graciously, with the expression of a hope that we should meet again in Berlin. Our return journey followed on the 3d of September."

During the time which his Imperial and Royal Highness spent in England and Scotland, as well as subsequently in the Tyrol, the German political newspapers which boasted of possessing trustworthy sources of information near Mackenzie, as well as he himself, announced a continually progressive improvement in the condition of the august patient. This was especially the case with the *Berliner Tageblatt*, since its intelligence was obtained from a correspondent who stated that he had been sitting in a room next to Mackenzie's, when he was applying the galvanic cautery to the larynx, who subsequently accompanied him on his journey to Italy, and was one of his daily visitors at Charlottenburg.

The editors of the journals in question considered these communications so trustworthy that they did not hesitate to found upon them, in the summer, the bitterest comments upon the "pessimistic" thinking of German surgeons.

The same course was taken by the *British Medical Journal*, which more than once has named Mackenzie directly as the source of its information. If we compare the weekly notices of this professional print with Dr. Landgraf's reports it is unintelligible how its correspondent could write in July—in No. 335, of July, 1887—:—"The Crown Prince has made a satisfactory progress towards complete recovery. His voice has gained much in strength and resonance, and is almost free from hoarseness. He is able to use it

without difficulty in common conversation, provided, as is easily intelligible, that this is not a very fatiguing. There still exists a slight congestion of the larynx. The action of the vocal cords is now completely restored, with the exception that the left cord, where the tumour was, shows a slight unevenness. Nothing of an abnormal nature is at present visible, beyond a small elevation at the base of the root of the little wart; and this basis or stump is, according to all appearance, in a completely quiet state, and shows no sign of inflammation or of increase. The local conditions are, in fact, so satisfactory that the treatment at present is only "wait and see." Yet more. The *Reichsanzeiger*, published on the 2d of September, 1887, a report sent from Flushing by the surgeons of the august patient, which could scarcely be considered by the public in any other light than as an indication of convalescence. "The health of his Imperial and Royal Highness the Crown Prince has latterly made good progress, and his general condition is excellent. Since the last cauterization (July) no new growth of the previously existing swelling has occurred. A return, however, is not improbable. Such a return would delay convalescence, but in itself would not be serious. Complete rest of the voice, with avoidance of cold and moist air, are the chief prophylactic measures, which for some time must be enforced." To the original of this English bulletin by Mackenzie, Surgeon-General Wegner added in the German translation the one sentence, "The voice is still hoarse." Without this addition it would have been understood as a declaration of complete convalescence.

If it be remembered that the announcement of the assured restoration coincided with the elevation of Sir Morell to the rank of baronet, it is intelligible that the whole German people should be ready to express their admiration and veneration for the English surgeon; and it is also intelligible that the journals, which extolled him as the only surgeon deserving an unqualified success, should have only fault-finding and sharpest censure for the German doctors who had been brought together in May. Berlin rejoiced in the expected return of the at last convalescent Crown Prince, and made ready for a festive reception. He came the first installation. The Crown Prince avoided Berlin. The Majesty of his venerable father had expected him in vain.

People naturally inquired why it was that the surgeons who had conducted the treatment in summer were afforded no opportunity of convincing themselves of their error by inspection; but it was a source of consolation that the Crown Prince had shown himself in complete health and strength at Frankfurt, and that an abundance of satisfactory reports appeared in the 'best informed journals.' These dispersed also the newly-arising fears which were caused by the amount of continued hoarseness at Toblach, of an attack of suffocation, and of a suddenly required emigration to Venice. At Bayona all appeared to be well, and the Press cited the frequent walks abroad, and the residence at a bracing high elevation, as the best proof how completely the German doctors had cured in their anxiety. The world thus pacified, was not a little surprised at the announcement, in the beginning of November, 1887, that Mackenzie had been summoned from England to San Remo in all haste, that he had pronounced the disease to be cancerous, and that he had desired other doctors to be called in.

It is easily intelligible that His Majesty the Emperor and the whole of the Royal family were thrown into no small agitation, so that His Majesty urgently demanded trustworthy reports on the condition of his son and the heir to his throne. For the purpose of obtaining them, his Royal Highness Prince Wilhelm was commanded to hasten to San Remo, with a confidential surgeon, for which purpose Dr. Schmidt, of Frankfurt-a.-M., was sent by the Emperor's physicians. Professors Gerhardt and von Bergmann were not selected as it was to be feared that Mackenzie would describe their report as a prejudiced one. In the same way, the assistance of the State Professor of Laryngology, B. Frankel, was relinquished, because it was understood that Mackenzie had objected to him, and had preferred Dr. Krause, who had only recently established himself as a Privat-Dozent at

Berlin. The Emperor wished to receive a report from an authority of perfectly unbiased personality.

The proceedings of the medical consultation and the results are communicated by Professor Schrötter, of Vienna, and Dr. M. Schmidt, of Frankfurt-a.-M.

REPORT OF PROFESSOR SCHRÖTTER.

"On receiving, at 9 o'clock on the evening of the 6th of November, 1887, a telegraphic summons from General von Winterfeldt, calling me in haste to San Remo in the name of the German Crown Prince, I made immediate arrangements, and started at 7 o'clock on the morning of the 7th. I reached San Remo at half-past 7 on the evening of Tuesday, the 8th, and was met at the railway station by Surgeon-Major Dr. Schrader, who conducted me to the Hotel Méditerranée, opposite the Crown Prince's villa. I was told on the way that Dr. Krause, of Berlin, had also been summoned to the consultation, and felt somewhat surprised, because, in a case of such high importance, I had only expected to meet physicians of proven experience. On the other hand, I knew Dr. Krause, who had for a long period studied the speciality at my clinic in Vienna, to be a very assiduous young physician.

At the hotel I was very cordially greeted by Mackenzie, whom I had previously well known, and who expressed his regret that he had been accidentally prevented from meeting me at the railway station, and that he was unable to spend the evening with me. I was offered the choice of examining the exalted patient alone the next morning, but I declared it to be more desirable, in his interest, that the examination should be made by all the physicians together.

"After the arrival of Dr. Krause, on the morning of the 9th of November, and in the presence of Dr. Schrader and of Dr. Horvitz, who made illustrative remarks concerning the time during which he had been in sole charge of the august patient, Morell Mackenzie gave a detailed account of his opinions concerning the disease and of its progress up to that time, as well as of the operations which had been performed. It must be mentioned, as the most important part of this report, that when Mackenzie first saw the Crown Prince at San Remo, and observed the changes in the growth, he said, 'Now it looks like a cancer,' and admitted, in reply to my direct question, that he had used this expression.

"We then proceeded together to the Villa Ziria, and were received in the most friendly manner by his Imperial Highness, who was looking well, and whose voice, although hoarse, was easily intelligible; and I was permitted to make the medical examination in an adjoining darkened chamber. This was the more easy, as the gracious patient not only put no difficulties in the way, but willingly, and with cheerful observations, permitted everything to be done which was required for the completion both of the external and of the laryngoscopic examination, although this might be to some extent irksome to him, since he had been accustomed by Mackenzie to a method which was somewhat different from mine. The Crown Prince was, moreover, so completely familiar with the details of the examination as to remark, when Krause followed me, 'Ah, right; you examine in the same way as Schrötter; you were a pupil of his.'

"Although it is my usual custom to make a careful examination of the organs within the chest, I abstained from doing so in this case, since I was assured by Dr. Schrader, in the most positive manner, that these had been found to be entirely healthy in several previous examinations, and also that no disease was discoverable in any other part of the body.

"The visit occupied but a short time, and we then returned to Mackenzie's small apartment at the hotel, where the expression of a common written opinion was to be accomplished.

"But as soon as I had in a few words expressed my own view, it appeared that there existed a more profound difference of opinion than I had anticipated, it being, especially Dr. Krause, who strongly indicated the possibility of there being no new formation, but that we had to deal with another disease—an opinion for which I could discover no foundation. I therefore desired to furnish a separate report, declaring that it was one to which I should be content to adhere in all circumstances. It is self-evident that

at such a moment I should act with the greatest circumspection, and especially in this case, since Dr. Schrader had informed me that the opinions delivered would be sent to the highest quarter in Berlin, to be deposited in the archives of the German Empire.

"Dr. Krause permitted me to dictate my opinion to his pen. My protocol expressed in an exhaustive manner the conviction that the aëgust patient was suffering from an œdema of the larynx, consequent upon perichondritis, itself occasioned by the invasion of a cancerous new growth.

"It is true that the diagnosis, on account of the œdema, was at this time difficult. It was only when I put together what I had learnt from the professional journals of Berlin, what Mackenzie and Schrader had told us, and, lastly, as the most important, what in spite of the œdema I had been able to observe, the thickening of the larynx externally, the swelling, albeit not considerable, of the lymphatic glands, and, finally, the laryngoscopic examination, that I could arrive at no other possible conclusion. The œdema of the left half of the larynx showed superficial projections, extending downwards from the ary-epiglottidean fold, which would not be present in simple inflammatory swelling, and which could only be seen when the body was directed towards the right, and the head rotated towards the left—a position which the patient most willingly consented to assume. Complete immobility of the left half of the larynx, with the accompanying external thickening, could only be referred to disease of the deeper lying tissues, and especially of the crico-arytenoid articulation of this side.

"As when we had referred these appearances to a crico-arytenoid perichondritis, the question had yet to be answered how this could come into existence. The repeated occurrence and disappearance of the œdema, the long duration of the disease, and in connexion with this the non-formation of abscess, all told against a simple perichondritis. Regard being had to the exclusion of every other constitutional malady, to the age of the patient, to the nature of the larynx, to the peculiar faceting of the tumour, and—although to this I attached the smallest weight—to the swelling of the lymphatic glands, there could be no other explanation than a cancerous new growth.

"I also laid it down that only two courses were open in regard to treatment. 1. Simply to wait until the further development of the growth involved a danger of suffocation which might be obviated by the performance of tracheotomy at the lowest possible point—in operation which would not be curative, but designed only to prolong life, notwithstanding the further progress of the disease. 2. To remove the larynx in the hope of effecting a radical cure. This operation may be either the removal of half or of the whole of the organ. The first examination left me in doubt, on account of the existing œdema, whether the removal of half the larynx would be sufficient; and, admitting that this question would be cleared up during the performance of the operation, I thought it probable that there might be necessity for total extirpation. It was self-evident that the patient must in the first instance be made thoroughly acquainted with the danger which so serious an operation would entail; and it seemed to me that before finally deciding upon so grave a procedure, the scientific assembly should be called together by which the Prince and previously been treated in Berlin.

"I further held it to be of the highest importance to establish the correct diagnosis, in order that no time should be lost in other useless therapeutic measures, but that the required operation, *supposing it to be decided upon*, should be undertaken without delay.

"Dr. Krause then wrote down his own opinion, which now in the main coincided with mine, although he said more concerning the great operation, and that in a sense unfavourable to it.

"In the afternoon we were received by her Imperial Highness the Crown Princess, evidently in order that we might communicate the whole to her; and I had the honour to read to her the above described protocol, upon which it became manifest that on her side

there were objections to any serious operation. In this view the Royal lady was so strongly supported by Dr. Hovell, in reply to a request for his opinion, that I could not be sufficiently surprised. I ventured to observe that the right of decision rested with the patient himself, and that it was never considered proper to exert too great an influence on his conclusion, the province of the physician being limited to a clear exposition of the facts of the case, and of the chances which each form of operation might afford.

"Since her Imperial Highness thought, as was certainly possible, that a subsidence of the œdema within the next few days might render it possible to see better, and that I then might modify my opinion as to the nature of the disease, I consented, at the especial wish of her Imperial Highness, to delay my departure until the 11th of November. But I expressed myself decidedly against Mackenzie's proposal to remove any further portion of the growth by means of the laryngoscope for the purpose of microscopic examination, since such an operative procedure might occasion either the more rapid increase or the disintegration of the new growth, and since it was very doubtful whether even the most skilful examiner could be able, from fragments of the growth in its present state, to express any decided opinion.

"On the same evening arrived his Royal Highness Prince Wilhelm, accompanied, by command of His Majesty the German Emperor, by Dr. Schmidt, of Frankfurt-Main. We remained in the evening with his Royal Highness, when I again expressed my opinion in the above sense in a decided manner. When we physicians afterwards sat for a long time with Mackenzie, all possibilities were again discussed, and differences of opinion with respect to the diagnosis became evident.

"On the following morning, the 10th of November, at half-past 11, we again made an examination of his Imperial Highness, in which Dr. Schmidt took part. Since the swelling had somewhat diminished, not only were the changes on the left side more characteristically pronounced, but, also, there was visible a nodule on the right true vocal cord, which, if I had previously entertained any doubt, must have confirmed my original opinion, so that in the subsequent consultation I was unable to change my views in respect either of the diagnosis or the treatment. Dr. Schmidt also coincided with me entirely.

"On the morning of the same day an opportunity was afforded me of speaking to the Crown Princess, who expressed herself with the greatest decision against extirpation, and only in favour of the tracheotomy whenever it should become necessary, as, under the circumstances, she wished to see the life of her beloved consort prolonged; an end which only in this way she regarded as attainable.

"I thereupon ventured to remark that, in this case, a skilful German surgeon should be summoned to San Remo, since it was impossible accurately to foresee at what time the operation might become necessary. From other points of view it was desirable that the aëgust patient should remain for the present in the South. I proposed to communicate with Professor von Bergmann, so that he might hold himself in readiness to proceed to San Remo immediately on receipt of an order, and that in the meanwhile, to be prepared against all contingencies, he might send one of his most skilful assistants to be upon the spot.

"On this proposal the Crown Princess then gave no decision, since she believed herself to possess in Dr. Hovell a sufficiently skilful surgeon.

"In the evening we were once more received by his Royal Highness Prince Wilhelm, and afterwards I drew up, at the request of the Crown Princess, an explicit memorandum upon the chances offered by extirpation of the larynx, as opposed to simple tracheotomy, Dr. Krause again acting as secretary. This document expressed opinions in which we were now all agreed, and was intended to serve for the information of his Imperial Highness the Crown Princess after verbal communication. We had determined to place the facts as clearly as possible before his Imperial Highness in our reports; but, in order to soften the painful details, that these



should be given to his Imperial Highness in writing so that he might quietly consider them and decide.

Prior to the last examination on the morning of the 11th, I again had the honour of a short conversation with her Imperial Highness the Crown Princess. The Royal lady, filled with loving care for the patient, requested me to impart to him the necessarily heavy tidings as gently as possible, and at the same time assured me that my earnest desire for a German operator should be assented to. I could not refrain from expressing my best thanks, and said, 'Now I shall go home tranquillized.'

After the august patient had since the day before used cold compresses, and had several fragments of liver, the edema was somewhat less, but the essential aspects of the disease had in no way altered, and my opinion therefore remained the same.

I now had to fulfil the painful duty, for which the voices of my colleagues had selected me, and to acquaint his Imperial Highness with the results of our examinations and with our conclusions. I did this in the presence of her Imperial Highness the Crown Princess, and may well declare that the scene belongs to the most touching of my life.

"The august patient, who exhibited no trace of emotion, smilingly declined my request that he would be seated, and heard my report standing, with philosophic calmness, with truly heroic courage.

"As I spoke of the chances of the two operative procedures, the gracious expression of his countenance underwent no change.

"Deeply moved, I was fortunately able to say that I had recently had an opportunity of witnessing, in an old gentleman, the complete spontaneous disappearance of such a new growth in the larynx; and the august patient was manifestly rejoiced when I stated that in this instance the subject was 70 years of age. He replied, 'Oh, I am still in the fifties.'

"After his Imperial Highness had questioned the other physicians as to whether they wished to add anything to my communication, which they did not, he put to me the direct question, without in the least losing his composure, whether the disease was cancer. To this I was compelled to make a somewhat circumlocutory reply.

"The deepest impression was made upon us by the gracious and heart-winning way in which we were dismissed. No uninstructed bystander would have imagined that so tragic a scene had been enacted. The truly heroic man pressed my hand at parting, and said 'Till we meet again, if God will.'

"The Crown Princess also dismissed us in the most gracious manner, after having expressed her complete satisfaction with the course of action agreed upon.

"Surgeon-Major Schröder then handed to the august patient the written memorandum on the chances of the different operations which had been prepared on the previous day, and after a few minutes we received in writing the decision of his Imperial Highness not to undergo the major operation, but only the tracheotomy if it should become necessary.

"We next assembled at General von Winterfeldt's, and there, in the presence of his Royal Highness Prince Wilhelm, the wording of the first bulletin for the *Official Gazette* was decided upon, as well as a series to follow it, which should gradually become more and more serious, so as to prepare the public by degrees for the gravity of the situation. It would manifestly have been possible to put before the public only the diagnosis of perichondritis. On what account the settled plan was departed from, and how it became possible that what passed in a most confidential circle of physicians was, on my return journey, which commenced within an hour after our consultation, published in the newspapers in the most outspoken manner, is to me unintelligible. The subsequently often-renewed changes in the reports of the nature of the disease, as well as the repeated changes in the treatment, of which last I only read in the newspapers—except that, to my surprise, the statements were in some instances confirmed by personages whom I had every reason to consider well informed—could not but deeply pain me, in view of the absolutely normal course of the disease.

"I must also add that her Imperial Highness the Crown Princess commanded me to impart the actual state of the case only to His Majesty the Emperor of Austria, and to the Crown Prince of Austria, and to refrain from any kind of publication, which command was removed a few days after my return. After this, when I was no longer under an obligation to preserve silence, I made only some verbal communications in private circles, and it is not my fault if these were spread abroad in an unblushing manner."

"REPORT OF THE SANITARY COUNCILLOR, DR. MORITZ SCHMIDT.

"On the 10th of November I found a yellowish semi-transparent edema of the left ary-epiglottoid fold, so large that it left visible only the anterior two-thirds of the right vocal cord, and about a fifth of the left. Below the latter I observed a dark red swelling with a yellowish surface deposit. The whole mucous membrane of the larynx was strongly reddened.

"On the 11th of November the edema had so far subsided that I could clearly see the greater part of the left vocal cord and the posterior wall of the larynx, as well as the whole of the right vocal cord.

"The mucous membrane of the larynx was still strongly reddened. Below the left vocal cord, and for its whole length, the sub-glottic region was swollen, so that it projected beyond the cord, of a dark red colour, and along almost the whole length of this swelling I saw an irregular, slightly excavated, yellowish patch, which I regarded as superficial ulceration. The swelling of the sub-glottic region extended over the posterior wall to the right side, where it terminated in a red nodule the size of a millet seed, on the posterior third of the right vocal cord. Also at the anterior angle of the glottis the same swelling extended a little over the median line towards the right.

"The left vocal cord was immovable.

"I found the lymphatic gland of the conoid ligament as large as a small pea. The submucillary glands on the left were slightly swollen. This might be ascribed to a recent gumboil.

"In consideration of the gradual development of the disease during 10 months, of the age of the august patient, and of the laryngoscopic appearances, I could only regard the case as one of perichondritis excited by carcinoma. I specially remarked that only in carcinoma had I ever seen such a nodule as that upon the right vocal cord.

"Since the swelling had already overpassed the middle line, any question of operative interference rested between the total removal of the larynx and a merely palliative tracheotomy. The total removal might yet be performed with prospect of a good result; but the uncertainty of the issue forced the physicians in consultation to recommend his Imperial and Royal Highness to submit himself to the operation.

"A communication upon the operations which might be performed, their dangers and their prospects, was prepared by the physicians.

"After his Imperial and Royal Highness had considered this communication, he decided against the removal of the larynx.

"It is the customary practice, after affording complete information to the patient, to leave the decision to him.

"The communications afterwards made to me in Berlin by the physicians who had previously attended his Imperial and Royal Highness, the drawings which they showed me, and the wax model of the appearances which was made by Professor Tobold in May, 1887, and which the physicians assured me was an accurate likeness, left me without the smallest doubt that the condition which I saw in November was the direct continuation of that which had been observed from March to May, 1887.

"The course of the disease since November, with its variations and appearances, which it is true I did not directly observe, establishes in the clearest way the correctness of our diagnosis.

"I have seen temporary, and even considerable improvements in almost every case of laryngeal cancer. The course of the disease, from beginning to end, appears to have been customary and typical.

"The declaration, which was prepared by the physicians assembled at San Remo from the 5th to the 11th of November, had the following purport:—

"After repeated careful examinations, the assembled physicians are completely clear that the case of his Imperial Highness is one of cancer of the larynx. With respect to the treatment, all possibilities were at the same time thoroughly discussed. His Imperial Highness was also informed, and low tracheotomy in due time was recommended."

"Signed
"Morell Mackenzie, Schrötter, Schrader, Krause, Moritz Schmidt, Mark Howell."

"It is known that his Imperial and Royal Highness after receiving information concerning the significance and prospects of total extirpation of the larynx, which only, on account of the extension of the disease to the right side, could now come under consideration, decided against the physicians, and communicated his decision in writing to the physicians."

"The august patient had received the intelligence of the gravity of his disease with great firmness and heroic resolution. It seemed to those around him as if with the formation of the decision, which the opinion of the physicians had occasioned, the disposition of the Crown Prince had become better and more tranquil, nay, even cheerful."

"Immediately after the consultation at San Remo Dr. Schmidt returned to Berlin, where he arrived on the morning of the 13th of November, and was soon after received by His Majesty the Emperor, together with Surgeon-General Leuthold, the Surgeon in Ordinary to His Majesty, and Professor von Bergmann, in order to make a report. On this the official report of the physicians in the examination of the larynx of his Imperial and Royal Highness the Crown Prince, the assembled physicians have ascertained that the disease is due to the presence of a malignant new formation. The new growth is chiefly beneath the left vocal cord and on the posterior wall of the larynx, but small beginning is also visible on the right side. The disease is at present local, and has not affected the general health. The danger of the new growth depends upon its gradual increase. Since his Imperial and Royal Highness has not decided in favour of the removal of the whole larynx, an opening into the trachea will probably be required, in a longer or shorter time, on account of difficulty of breathing."

"Since the physicians assembled at San Remo considered the removal of the larynx, in the most favourable case, to be attended with such serious consequences in the after life of the patient that they could not decide to recommend it unconditionally, but left the decision to the august patient himself, it soon followed that His Majesty inquired whether the operation ought not to be further discussed, and even urged upon the otherwise lost patient. At the same time, His Majesty expressed a wish that an authentic exposition of the history of the disease, showing why the operation which had been planned in May and June had been abandoned, and why the question of operation had only been revived so late, should be placed on record. For this purpose the Deputy Minister of the Royal Household, his Excellency Count Stolberg-Wernigerode, assembled on the 13th of November the following physicians:—Professor von Bergmann, Physician-in-Ordinary, Professor Geilker, Professor Tobler, Physician-in-Ordinary Leuthold, Dr. Schmidt, and Staff-Surgeon Landgraf, for a conference at the Royal House Ministry."

"The protocol prepared by this conference, together with the appendices to it, which the conferring physicians furnished from their notes, histories of the case, and drawings, were placed among the documents of the Royal House Ministry, and have furnished the foundation for the present report."

"The conferring physicians, like those who assembled at San Remo, were of opinion that at last time there could be no other question than that of total extirpation of the larynx, and no longer of the partial excision which might have been accomplished in May. Although there were several well-established cases of permanent recovery after total extirpation, yet all the consulting

physicians were agreed that the patient alone should decide upon the undertaking of an operation so dangerous to life, and which led to so serious a mutilation, and that therefore on this point no more could be said. Why no operation was performed in the summer of the deposited reports would show. After the physicians who assembled in June of the foregoing year had obtained a precise promise that the operation should be performed in case of increase of the growth, the physicians now assembled must lay the guilt of the too late upon the physician who had overlooked this increase, and had even disputed it, although it had been pointed out by Dr. Landgraf with the greatest certainty, and a new consultation had been urgently demanded."

"The report of Professor Schrötter, which was read by Dr. Leuthold, as well as the verbal communication made by Dr. Schmidt, established that at any time an adenoma might occur in the ary-epiglottidean folds at the entrance to the larynx, and that then life would be in the greatest danger, only to be obviated by the speedy performance of tracheotomy. The physicians said with much decision that a surgeon skilled in tracheotomy should be at once sent to San Remo in order to afford the necessary help in the dreaded eventuality. Professor von Bergmann mentioned the first assistant at his clinic, Dr. Bramann, as being best qualified for this purpose. The other physicians assented."

As an immediate consequence of the opinions expressed about the condition of the august patient, at the consultation of physicians on the 9th of November, Surgeon-Major Schrader wrote on the 11th of November to Professor von Bergmann as follows:—

Sir,—In obedience to the high commands of his Imperial Highness the Crown Prince and her Imperial Highness the Crown Princess, I submit to you confidentially the last report of the laryngoscopic examination, and I have to ask you to undertake the performance of the tracheotomy, which will eventually become necessary, this being the express wish of all the physicians assembled here in consultation."

Immediately, by telegraph, and soon afterwards by letter, Professor von Bergmann thanked Professor Schrader for the confidence reposed in him, and declared his willingness to undertake the operation."

As not only the physicians assembled at San Remo, but also those in Berlin, had declared with certainty that an adenoma of the glottis, or some other swelling which might obstruct the orifice of the larynx, might be suddenly developed, previously to the arrival of Professor von Bergmann, it was necessary that a trustworthy operator should in any case be at hand. The Deputy Minister of the Imperial Household did not venture to wait longer before providing the necessary assistance."

Dr. Bramann, therefore, at the command of His Majesty, left Berlin on the evening of the 16th of November, and arrived in San Remo on the 18th, where he immediately had an interview with Drs. Krause and Schrader, and was informed by them of the condition of the disease."

On the 28th of November Dr. Bramann was for the first time invited to join the consultation of the physicians who were daily in attendance. On this occasion he reported that he saw a considerable swelling above the left vocal cord, which latter either was not present, or was by the swelling completely hidden, so that it was invisible. The swelling on the left side extended from the anterior commissure to the posterior wall of the larynx, and extended upwards nearly over the whole of the thyroid cartilage. The mucous membrane covering it was neither inflamed nor reddened, but at one spot, posteriorly, below the arytenoid cartilage, a small ulceration appeared to exist. What there was below the diffused swelling on the left could not be ascertained. The right vocal cord appeared intact, its posterior part possibly somewhat thickened. In phonation it moved so considerably that it reached almost completely to the swelling in the region of the left false vocal cord, and in this way a voice was produced, although one of weak tone. No glandular swellings were discoverable in the vicinity of the larynx itself, nor on the sheath of the vessels; but the



left half of the thyroid cartilage, especially in its posterior part, felt as if diffusely thickened. Neither pain, discomfort, cough, nor expectoration was present. Dr. Brannann made a second examination on the 9th of December, which gave nearly the same result, while the other physicians spoke with certainty of a retrogressive metamorphosis of the swelling and a healing of the ulceration which they had previously seen in its posterior portion. As during the interval iodid of potassium had been administered, the improvement had been attributed to this medicine, by which the "chronic perichondritis" had been brought to "breaking" and "resolution" (see the letter of Deputy Physician in Ordinary Dr. Schröder to Surgeon-General Leuthold).

However, even as early as the 10th of December, Drs. Krause and Hovell perceived a more acute hyperemia, and greater swelling on the posterior wall of the larynx, as well as a small ulceration in the neighbourhood of the tumour below the false vocal cord. Dr. Hovell reported telegraphically to Mackenzie, on the 13th of December, on this and on other disturbances, granulation formations, which he had observed, and Mackenzie on the 15th arrived in San Remo. Dr. Brannann was not summoned to the examinations and consultations of the 16th and 17th. He examined again for the first time, at the desire of the august patient, on the 23d of December, and found a considerable alteration.

The voice was hoarser than before, the swelling of the ary-epiglottidean fold was much more considerable, and this was still more true of the descending adjoining infiltration, which attained its greatest intensity in the region of the false vocal cord. Moreover, nothing could be seen either of the vocal cords or of the deeper lying parts. The swelling on the left side was in intimate relation with the diffused infiltration of the posterior wall, and was separated from it only by a shallow furrow. On the posterior wall the swelling not only existed on the left side, but extended to the region of the right arytenoid cartilage, and downwards to the insertion of the vocal cord. It was considerably greater than 14 days before, and on the left, at the level of the false vocal cord, was partially ulcerated. From here the ulceration extended downwards on the posterior wall to the level of the vocal cord; but it could not be accurately ascertained whether there was a collection of secretion or an increased swelling covered with a gray exudation; at any rate the surface was somewhat uneven and nodulated.

While from the other side it was asserted that all was normal on the spot where the first swelling had existed, yet this statement was unintelligible, on account of the swelling of the left ventricular band, which concealed the deeper parts. It was impossible to see the region of the vocal cords, far less, therefore, that which lay beneath it. From the extension of the ulceration and the swelling of the posterior wall, it might be assumed that there were certainly other changes, possibly very profound changes, to which the swelling of the false vocal cord was only secondary. The ulcer was ulcerated near the middle, the ulceration only a little elevated, and its boundaries not completely to be seen, especially in a downward direction. A few days before, according to the report of the other physicians, his had been prominent, and in the last few days had become flatter and smaller. The report furnished by Dr. Brannann concluded with the observation that from the *changes which had occurred during the last 14 days it was probable that tracheotomy would be required*.

At the end of the term (i.e., about the end of January), in the same week the *British Medical Journal* published—(No. 1,499, p. 1,495).

"It is with much pleasure that we are able to confirm, on independent authority of the most trustworthy kind, the favourable statements in the general Press as to the present condition of the Crown Prince of Germany."

On the 26th of December Sir Morell Mackenzie appeared again in San Remo. After his first examination, he assured many of the gentlemen of the House-

hold, as well as the Deputy Physician in Ordinary, that he doubted more and more the existence of cancer, that the swellings which he had observed 14 days previously were breaking up, and that general cicatrization was commencing.

The favourable aspect of his Imperial Highness on Christmas Eve, and on the New Year occasion the Press, to engage, in polemics against the diagnosis of cancer which had been formed in November. The *British Medical Journal* especially, wrote—(No. 1,410, p. 31).

"It is with profound satisfaction that we learn, on the highest authority, that the symptoms which caused so much alarm at the beginning of November have almost entirely disappeared. The growth in the subglottic region, which was then looked upon with such suspicion, has now shrunk to a fourth of its former size; the ulcer on the surface has completely healed, and the submaxillary glands, which were enlarged and hardened, are now in a perfectly normal state. The little growth which recently showed itself on the left ventricular band (false vocal cord) sloughed away very soon after its formation, and the ulcerated surface left behind was nearly cicatrized when Sir Morell Mackenzie left San Remo. The Prince is now quite free from the slight but constant feeling of discomfort about the larynx, from which he had suffered since the beginning of last year, and his face has lost the somewhat waxen pallor which struck so many observers when his Imperial Highness was in England. We are able to state that in the opinion of Sir Morell Mackenzie the appearances in the Crown Prince's throat are now quite compatible with the more severe form of chronic laryngitis. In illustration of this, it may be interesting to quote some remarks from his work on 'Diseases of the Throat,' vol. I, page 288, where it is stated that 'in addition to congestive swelling of the mucosa and submucosa, there occurs in some rare cases an organic thickening or hypertrophy of the soft structures.' It is also stated there that 'in cases where the result of chronic inflammation are often met with,' presumably in the rare cases just alluded to. These words were written eight years ago, and the case of the Crown Prince would seem to be a perfect example of the morbid condition which they describe. In such a case chronic inflammation process, there is no doubt that perichondritis is also present. In speaking of this affection, Sir Morell Mackenzie (op. cit. p. 391) has called attention to the frequency of 'impaired action of one or both of the vocal cords,' and it may be remembered that in the case of the Crown Prince the action of the left cord has been defective for many months past."

At the conclusion of the first week in January a report was spread abroad in San Remo that the swelling on the left side had passed over to the right, and on the 13th there appeared in the official *Gazette* a bulletin which said—

"The phenomena of the disease existing during the last two weeks have been a somewhat greater swelling of the left half of the larynx, and from it a somewhat generally extended inflammatory irritation of the mucous membrane of the larynx, together with an increased secretion of mucus, which, together with the inflammation, is again diminishing. The general condition is very good."

In immediate succession to these appearances, on the 14th, 15th, and 16th of January, there occurred headache, febrile temperature, together with difficulty of breathing and slight stridor, until on the 17th the august patient coughed up a piece of dead tissue, which for three days had been observed floating in the larynx. This was sent for examination to Virchow. The report of his examination has been published, but it has not become known that the piece was first handed to the Warsaw physician, Dr. Virchow, who was in San Remo, and who, for the purpose of preliminary examination, retained a part; so that Virchow did not receive the whole piece, but only the larger portion of it.

Virchow described the portion sent to him as a dead and decomposing part of the larynx, which was detached from the surface to a depth of about four millimètres. Only in one still hard spot could be discovered in every microscopic section the so-called nests (*twiebeln*) of

epidermoid cells, mostly become completely monogenous. These nests were in the covering layer, or in its immediate vicinity. He could not find epidermoid nests in the deep portions; and clearly isolated alveoli, notwithstanding persevering search, were not found. Hence this opinion also was utilized in opposition to the diagnosis of cancer.

On this occasion, however, the pathological anatomist, in consequence of painful experience of the interpretation which had been attached to his earlier opinions, wrote to Krause that he must be careful with regard to the significance of the observations described. The medical correspondent of the *British Medical Journal* at San Remo did not follow this counsel; for on the 4th of February, 1888, there appeared in that journal:—

"We are pleased to be able to confirm, on the highest authority, the favourable reports as to the condition of the German Crown Prince which have appeared during the last few weeks. The slough which, as we mentioned last week, came away on January the 17th from the site of the growth which excited so much alarm in November, was more than two centimetres long. The raw surface left by the separation of this piece of disorganized tissue has now almost entirely healed, and the condition of the neighbouring parts is highly satisfactory."

On the 25th of January Sir Morell Mackenzie again arrived in San Remo. He called the same evening upon Dr. Bramann, and asked him to examine with him the next day; because, although tracheotomy was not then necessary, no man could foresee what the immediately coming time might bring. During Bramann's visit on the morning of the following day Mackenzie again asserted that the left side had considerably improved, that the swelling was smaller, so that the left vocal cord could be seen, and that it was no way disturbed. On the right, however, the swelling was greater than at Christmas and was of an inflammatory nature; and he stated that it was this swelling which might soon render tracheotomy necessary, but that he should only consent to it when difficulty of breathing occurred. At 2 o'clock the afternoon, after thorough coining of the mucous membrane, Bramann examined the first. The larynx was, and also the posterior wall, showed a more considerable swelling than in December, so that the calibre of the larynx was diminished to less than half. The diffused swelling in the region of the left false vocal cord terminated below in an irregularly indented gray-coloured margin. Beyond this, on the left, nothing could be seen. The swelling projected into the tube in such a way that its summit in phonation passed over the margin of the tense right vocal cord. The *Rima glottidis* was, moreover, much narrowed from front to back, and the swelling underneath the right vocal cord, which extends to this from the front and from the left side, could not be inspected in its entirety. The right vocal cord itself was without doubt very much less movable than in December. On this it depends that the voice is absolutely toneless, and even by efforts no tone can be produced as it could be in December. There is no difficulty of breathing in gentle respiration nor in walking, even in quick walking, upon a level surface; but in ascending stairs, or in going up hill, difficulty occurred which the angust patient had himself noticed, and which he on this day mentioned to Bramann without a question being put. In speaking the want of breath was undoubtedly remarkable. The glands in the sub-maxillary region were not larger than before. On the other hand, on the left side, in the region of the lower half of the thyroid cartilage, could be felt a distinct thickening which extended as far as the cricoid cartilage, without involving the latter. The skin over this was movable, the swelling itself diffused, hard, even, and completely free from tenderness to the touch.

The regular and steady increase of the swelling and the perceptible swelling of the larynx which were now discoverable on the left side, the side of origin of the tumour, induced Bramann to urge, Sir Morell Mackenzie that Professor von Bergmann should be called in; adding that the Professor would willingly remain some days in San Remo if the tracheotomy were not required at an

earlier period. This request was then, as well as on the following days, refused. Upon this, and upon the further proceedings of the operation, Dr. Bramann wrote:—

"I have already during January on many occasions expressed to the attending physicians my regret that I had not been admitted as formerly, to the examinations of his Imperial Highness, especially since from the 14th to the 17th of January difficulty of breathing has been present. In these circumstances I must decline all responsibility if the tracheotomy be performed too late, or if the Privy Councillor von Bergmann, to whom the performance of the operation had been committed by his Majesty the Emperor, should arrive too late."

"On the 31st of January Mackenzie told me that the tracheotomy would in his judgment be necessary in from two to four weeks, and that this I should regard the operation. I expressed myself in the most decided manner against this, and insisted upon the observance of the arrangement made by the Imperial Family with Privy Councillor von Bergmann. I would only operate if the difficulty of breathing became suddenly and unexpectedly developed. For slowly increasing difficulty in breathing Professor von Bergmann must, in all circumstances, be summoned. Further, I made Mackenzie clearly understand that already, in ascending stairs, &c., some marked difficulty of breathing existed, and that further increase of it was to be expected; it was, therefore, to be desired that I should examine the angust patient at least every few days in order to observe his condition, since neither the Privy Councillor von Bergmann nor I would proceed to operate unless we ourselves were convinced of the necessity of the operation. We would in this respect act only in accordance with our own judgment. Nevertheless from thence until the day of operation I was never summoned—nay, on no single occasion did I even get the request to do so."

From the 1st of February I learnt in the course of the next few days that the Crown Prince frequently changed colour and that his breathing became more difficult, especially in ascending stairs. On the 3d and 5th of February, in the afternoon, I questioned Dr. Schradet on these observations, which he confirmed. I asked him whether even now I should not be called to the consultations, and whether, in view of the notorious, though apparently slight, difficulty of breathing, it was not advisable to summon Von Bergmann without delay. Dr. Schradet was of the same opinion, and would do everything that was possible in this direction, but begged me not to press, but to remain quiet, since he hoped to convince that my attendance at the consultations should be asked for.

"On Sunday, the 5th of February, Dr. Schradet and the adjutants reported to me that the noise of breathing had so increased that at the table almost every breath drawn by the Crown Prince was audible at the opposite end. In ascending the convenient steps of the villa he had to make several pauses. In driving out he certainly left the carriage, but only to proceed very short distances on foot. Besides the want of breath, he complained of great fatigue and weakness of the limbs."

"On Monday, the 6th, in the morning, the same gentlemen informed me of the increase of the difficulty of breathing, and before noon of the severity of it. I telegraphed to Privy Councillor von Bergmann:—"Stridor even in quiet breathing. Hold yourself in readiness for departure." Krause also informed me of the presence of difficulty of breathing and of stridor, which was to be attributed to rapid increase of the swelling on the right side. To my question whether it was not necessary and wise to bring Bergmann hither immediately, he answered that Mackenzie would come next day, and that then a decision could be arrived at. There followed a long conversation upon the diagnosis of the disease, in which Krause spoke in favour of perichondritis, and cited, among other proofs of the same, the expulsion of the piece of dead tissue—an event not observed in carcinomas."

"On the 7th of February I was told by Schradet that the night had not been good, and that Mackenzie had

discovered a considerable increase of the swelling. Notwithstanding Schrader now urgently pressed for the presence of Von Bergmann, nothing was done, and I received no summons to take part in the next consultation. It is remarkable that on this day, the 7th of February, the *Vorische Zeitung* published an article in which it was asserted, avowedly from English sources, that the tracheotomy would be performed on the following Thursday, the 8th of February.

Truk wrote on the 9th of February:—'The journals are incorrectly informed when it is said that this important operation will be performed by Dr. Bramann; it is true that this young gentleman is kept at San Remo for this and no other purpose, nevertheless I have the best reason to believe that whenever tracheotomy may become necessary, it will be an English head which will do the deed, just as an English head will order it.'

"On Wednesday, the 8th of February, I further learnt from Schrader that the night had been rendered bad by headache and that the stridor had greatly increased. Mackenzie would to-day request me to accompany him on Thursday's visit, and the question of summoning Von Bergmann, which I again pressed, would then be considered.

"On Wednesday afternoon I called on Mackenzie, since the Adjutant had informed me of very considerable difficulty of breathing, and it seemed rather, in view of this and of the anticipated tracheotomy, must not immediately, and rather too soon than too late, telegraph for Von Bergmann. He replied 'that in his opinion we had still eight or ten days' time.'

"In the evening of the same day, at about past 9, the Adjutant spoke to me very anxiously about the difficulty of breathing, and told me that during a conversation which the Crown Prince held at table with an invited officer of his Silesian Regiment, he was attacked by a spasm of such alarming whistling in breathing that all around turned to him in terror. As he left the table in order to go to the examining room, he himself asked, 'Is Dr. Bramann summoned for this evening?' which was denied.

"On the consultation of Thursday, the 9th of February, I observed immediately the very considerable difficulty of breathing of the Crown Prince, and the stridor which accompanied each breath. Speech was manifestly more difficult, and the august patient appeared much pulled down, and paler than before. To my question how the night had been passed, he answered me, 'Not well, but somewhat better than the nights before.' He had several times coughed violently, and had expectorated something shown me by an attendant. The water, which half filled a basin containing the expectoration, was thick and frothy.

"In the laryngoscopic examination, during which the difficulty of breathing was specially manifest, for both in inspiration and expiration a considerable impediment existed, the whole left half of the larynx, as well as the ary-epiglottoid fold, appeared considerably infiltrated, as well as the whole of the posterior wall of the larynx, especially the region of the false vocal cord, which projected like a tumour beyond the middle line towards the right. The right vocal cord was completely immovable, and beneath it, especially in the anterior half, there appeared a tumefaction of the mucous membrane, which passed away to the left, below the swelling of the left side. A rima glottidis was, indeed, no longer present, and the entrance of air was only possible on account of the difference of level between the swellings of the right and of the left side.

"After all had examined, I also felt the larynx from outside, and obtained evidence of the increase of the previously-discovered swelling of the left side of the thyroid cartilage, as well as of a thickening of the whole lower half of the larynx. We then proceeded to Mackenzie's lodgings, where he declared, without any circumlocution, that the difficulty of breathing had, since yesterday evening, very considerably increased, and had attained a height at which it was no longer possible to wait. He proposed immediate tracheotomy. Krause and Hovell concurred.

"I admitted the presence of increased difficulty of breathing as a natural consequence of the rapid increase of the swelling, but insisted on my earlier and repeatedly-

made declaration that I would not operate until I myself had observed the necessity. As I had seen the august patient only during the short time of our common visit, it was impossible for me to know whether the difficulty of breathing was always so great, or whether it was not partly occasional. I was, indeed, excited, accompanying the examination, and I therefore would not decide upon any immediate operation, but must demand a delay of several hours, during which an opportunity should be afforded me of examining the august patient, and also of immediately endeavouring to obtain the presence of Privy Councillor von Bergmann. In this view I was supported in a most energetic way by Surgeon-Major Dr. Schrader. Thereupon Sir Morell Mackenzie declared that he must decline all responsibility in case I did not operate. Krause and Hovell concurred with him. I adhered to my demand for a delay of at least some hours, the more as in case of any improvement I was quite decided to wait the arrival of Privy Councillor von Bergmann, since a tracheotomy under the existing circumstances must in no way be regarded as a trivial or indifferent undertaking. Finally the other gentleman yielded.

"In the meanwhile ice compresses were to be applied to the throat, and the larynx was to be brushed over with cocaine.

"Mackenzie superintended the carrying out of these directions, and said, moreover, that the opportunity of observing the Crown Prince should be immediately afforded me. A protocol to the following effect was then prepared:—'The difficulty of breathing which has existed during the last few days had, in consequence of the increase of the swelling on the right side, attained a degree which will render immediate tracheotomy necessary unless within a few hours improvement should occur.' I signed this protocol, with the addition that my signature referred only to the last portion of it, in that the tracheotomy would be necessary, &c.—as I could say nothing about the development of the difficulty of breathing to its present degree, for since the 30th of January I had not been called to any consultation on the august patient, and had not seen him."

"At half-past 12 Mackenzie came to me, and told me that the Crown Prince would expect me at 1 o'clock, and he repeated 'that he must decline any further responsibility, and that I alone must bear it.' At 1 o'clock I proceeded to his Imperial Highness, and was received by him in his bedchamber. The difficulty of breathing was greater than in the morning; the stridor very loud; at each inspiration there was drawing-in of the chest above and below the sternum, the lips pale bluish, the voice weakly, and great effort was necessary for him to speak. But, moreover, I learnt from the august patient that the last four nights, especially the last, had been very bad, terrible (*schrecklich*). Only by means of heaping up as many pillows as possible, and by sitting almost upright, had it been possible for him to sleep during some hours, but then with frequent interruptions. Upon the least movement in bed—for example, in turning towards one side, or in feeling for his pocket-handkerchief—the breath became exceedingly difficult, and at such times he had a sense of anguish and of choking.

"The valet who had watched during the last two nights by his august master told me, without being asked, what he had observed. The august patient, who a short time before slept in a horizontal posture, had only obtained rest for about six days when he sat with the head and chest raised as high as possible. His breathing was very loud—snoring—and from time to time, every hour or more frequently, there came periods when the august patient seemed to get no air, and then suddenly awoke, usually with coughing. In the night between the 7th and 8th the Crown Prince got up and came into his room with the words, 'I can bear this no longer; make me a cold compress for the neck.' The Crown Prince had for many days been unable to ascend the easy stairs to the first floor, which also the august patient himself told me.

"In the presence of these data, and of the constant increase in the difficulty of breathing from morning till midday, it appeared to be impossible to wait two days for the arrival of

Privy Councillor von Bergmann. I therefore imparted to his

* "In the monograph on tracheotomy in the work of Billroth and Lücke we read, 'In the whole literature of tracheotomy there are no more false or dangerous superstitions than that the operation can be easily performed on a suffocating person. The extension of this superstition has been due to bad text-books and hand-books of surgery, and to ignorant surgeons, who have composed their chapters after an experience of one or two operations, or even only in the study.' Still more clearly Billroth declares in another place that he does not shun any operation more than tracheotomy under these conditions. This may be for the instruction of those who have constantly spoken and written of Bramann's operation as a small and inconsiderable matter."

Imperial Highness that I thought it dangerous to delay the operation, and advised its immediate performance, to which he forthwith gave his consent.

"I now proceeded with Dr. Schrader to make preparations for the operation, and worked in the first instance for a convenient table. Unfortunately my wish to operate on a table could not be fulfilled. I was compelled to use a very broad bed for the purpose.

"When all was prepared for the operation new difficulties arose with regard to the employment of chloroform, since Sir Morell Mackenzie expressed himself energetically against it, on the ground that tracheotomy under chloroform was dangerous, and that in England the operation was performed without it. I replied to him that I had used chloroform in all my cases, and that I had performed more than 400 tracheotomies on children and adults; that in Germany chloroform was always employed, and that in the present instance, in which there rested upon me alone so very heavy a responsibility, I would not operate in any other way than under conditions which I considered proper, and to which I was accustomed. As in spite of all representations I adhered to this determination, in which I was actively supported by Dr. Schrader, Sir Morell Mackenzie yielded, but until he had first again disclaimed all responsibility for what might happen during the narcosis. The august patient, at the request of Schrader and myself, declared himself ready to take the chloroform.

"At the commencement of the narcosis, which I induced very gradually and carefully, difficulty of breathing occurred several times. The operator was very loud, and the drawing-in of the chest very considerable, as I pointed out to all the physicians present. In a comparatively short time, and without any period of excitement, insensibility was produced. I then handed over the control of the narcosis to Dr. Krause, while Schrader assisted me at the wound. Mackenzie watched the pulse at the left hand, and Dr. Hovell held two basins with sponges and artery forceps. I then pushed a firmly-rolled bolster under the shoulders in order to let the head fall back, an endeavour which only very imperfectly succeeded, for as soon as the head inclined backwards difficulty of breathing occurred, so that I was compelled to be content with an almost horizontal position. This was the more embarrassing since the larynx was situated very low, the cricoid cartilage reaching nearly to the suprasternal notch, and the muscles of the neck were very strongly developed. After I had in the first place disinfected the locality of the operation, and had shaved the neck over the hyoid bone, besides cutting off the points of the beard, I proceeded to the operation, during which I myself took the instruments, the dressing materials, and what I otherwise required, from a table placed at my left hand. I divided the skin and fascia by an incision six centimetres long, which commenced at the cricoid cartilage and extended to the suprasternal notch, and after arresting the bleeding, keeping accurately in the middle line, in the interval between the two strongly prominent sterno-hyoid muscles, I reached the fascia which covers the thyroid gland. This was thickly covered by numerous greatly dilated veins, and extended very low into the suprasternal notch. In consideration of the

difficulties which in such cases attend the exposure of the trachea below the isthmus, and, above all, in consideration of the danger of hemorrhage from the excessively over-filled vessels, which even with the greatest foresight could not be with certainty avoided, and which would require more assistance than I could obtain, I decided to proceed with the operation after the method of Bose, and after double ligature of the vessels proceeding to the isthmus on both sides of the trachea, I divided them. I could now so far push down the thyroid gland that five rings of the trachea were laid bare. At this moment there occurred a slight faintness. The face of the august patient was white, his pupils were dilated, his pulse was small and slow; but this condition quickly passed away. After complete arrest of bleeding, I now opened the trachea precisely in the middle line from the third to the fifth ring, and after I had satisfied myself that in the trachea there was nothing abnormal, and that no tumour could be discovered above, I inserted into the opening a large silver cannula, 11 millimetres in diameter, with a movable shield. I plugged the very deep wound around the cannula with iodoform gauze, and covered it with a simple bandage. Inclusive of the narcosis, the operation occupied 20 minutes.

"At the conclusion of the dressing the august patient woke up, vomited once, felt then much better, and repeatedly expressed to me and the other physicians his delight at the new easy and free breathing."

"Immediately after the operation, at the command of the Prince and Princess, the Deputy Physician, and Military, Dr. Schrader, telegraphed to von Bergmann that, notwithstanding the successful tracheotomy, he should come as soon as possible. At the same time Court-Marshal Major von Lynker telegraphed:—"Their Imperial Highnesses desire you immediately to commence your journey." A third telegram of similar import arrived after he had started some hours. The telegram which left San Remo at 10 o'clock in the morning for Professor von Bergmann was in his hands at 2 o'clock. At the same time he had been received by His Majesty the Emperor, who had been in the moon. He informed that the tracheotomy had become necessary, and who, with reference to the operation, commanded Professor von Bergmann to remain with the august patient until the wound had closed and the surgical treatment was terminated. After receiving the intelligence that the operation was already completed, His Majesty wished once more to speak to the Professor, and desired him to depart as quickly as possible, to furnish regular reports, and strongly to urge that as soon as the condition of the august patient would permit his return to Berlin should be advocated.

Professor von Bergmann travelled with the Chief House-Marshal Count von Radolinski, and arrived at San Remo on the evening of the 11th of February. In a few minutes after his arrival he saw the august patient, who made the best impression upon him. His Imperial Highness looked fresh and strong, was elastic in his movements, and expressed his pleasure, not only with the successful operation, but also with the rapid journey of the Professor.

The sequel is reported by Medical Privy Councillor Professor von Bergmann.

"The first days after the operation were favourable for the august patient; the bandage immediately below and around the cannula was dry, neither stained by blood nor by any other products of the wound. There was no fever; the frequency of respiration was between 16 and 22. On the morning of the 12th we changed the cannula. After the removal of the iodoform gauze occupying the angles of the wound, I convinced myself of the excellent condition of the wound. It was perfectly airtight. It was placed exactly in the middle line, and was free from blood collections, or from any inflammatory appearance. It is my custom not to leave the first cannula in position too long. The construction of the cannula which I use prevents, by its curvature, caused by its union with its sheath, any pressure upon the wall of the trachea. The shield is united to a double tube in such a way as to be movable in all directions, so



that the cannula may move either in a horizontal or in a vertical plane. The curvature of the cannula in its upper two-thirds is about a sixth part of a circle of five centimetres radius. The lower third is a straight line in the direction of a tangent to this circle. It is self-evident that under these conditions the only pressure, if any, must be exerted upon the front wall of the trachea. But this, on account of the movable joint between the cannula and its shield, the latter being fastened to the neck in the ordinary way, can only occur when the patient bends forward. In the upright or in a recumbent posture the anterior wall of the trachea must be relieved from pressure. Nevertheless, I changed the cannula every few days, and inserted sometimes one of somewhat greater, at other times one of somewhat smaller curvature; and, again, sometimes a longer and sometimes a shorter one; considering in these regards the formation of the neck of the patient, and varying the point of contact with the wound. We had 18 cannulae of different curvatures and of different lengths, of silver and of vulcanite. Bramann had from among these selected the one most convenient for the existing wound and for the proportions of the neck. The one newly introduced differed from his, which was nine centimetres long, only in this, that it was half a centimetre shorter and somewhat less strongly curved.

On the 12th and 13th of February there appeared, during attacks of coughing, which occurred about every three hours, a viscid brownish-coloured discharge from the cannula, and in cleaning the inner cannula which it contained mucus, this showed an admixture of small dark sticky clots of blood about the size of millet seeds, as well as of streaks and drops of fresh blood. The expectoration had a fetid odour. According to the statement of the patient, the coughing and expectoration during the last few weeks before the operation had presented the same characters. On the morning of the 14th of February, the astatic patient having coughed more frequently during the night, and the quantity of expectoration having been more abundant, Mackenzie, at the consultation which was held on the morning of that day, and again in the evening at 8 o'clock, ascribed the intermittence of blood to an ulceration of the posterior wall of the trachea occasioned by the cannula, and demonstrated the construction of the cannula which we had used in order to show how this must render contact with the posterior wall of the trachea impossible, and I drew apart the margins of the wound with two blunt hooks, and asked him to convince himself by sunlight of the intensity even of the absolute pale yellowish-rachetous mucous membrane at the incriminated spot. Moreover, as the piece of iodoform gauze placed in the lower angle of the wound showed no trace of blood, bleeding from a granulation could likewise be excluded, and my opinion was that the descent into the larynx of masses descending from the ulcerative destruction of the carcinoma, which had been in progress since the 17th of January, when a large necrosed portion had been coughed up, and had occasioned fever and headache, could no longer be doubted. In favour of my opinion, I pointed to the sticky consistence and the fetid odour of the small clots which were coughed up, as well as to the circumstance that exactly at that point of the convexity of the external cannula which was directed upwards towards the larynx a black spot of sulphureous silver was visible. This spot, since it lay immediately below the opening of the larynx, would receive the first descent of decomposing products proceeding from thence. Mackenzie disputed this opinion, and maintained his own, and wished me to assent to the use of his modification of Duval's cannula. The example of this cannula which he had brought with him he himself declared to be unsuitable; since it had a far smaller calibre than was required by the sticky character and considerable abundance of the mucus, which required a tube of wider diameter.

While I had assumed that the difference in the cause of the blood streaks and blood points in the expectoration would remain between ourselves until the question had been cleared up, I found that by noon of the same day Mackenzie had informed her Imperial Highness the Crown Princess that the more frequent

cough and the brown expectorations were the consequences of an unsuitable cannula which I had introduced, and which had irritated the tracheal mucous membrane. In the evening Howell laid before the House Marshall two drawings, one of which was intended to exhibit the pressure which my cannula exerted, while the other was to illustrate the more rational position of Mackenzie's. The next day there appeared, in those Vienna and Berlin newspapers which were served by correspondents of Mackenzie's (*Posten*),—One of the correspondents in question, published on the 19th of February, by a special edition in Berlin:—“Moreover, Sir Morell Mackenzie declared to me that you (the Editor of the paper), as well as the reading public, had for the last eight months had sufficient opportunity to know that the statements of the *Tagblatt* upon the condition of the Crown Prince were absolutely authentic; he did not authorize anybody to contradict me.”

San Remo, February 15, 10 45 a.m.
“The bloody colouration of the mucus which has existed for two days has been probably produced by the irritation of the cannula.”

I expostulated with Mackenzie concerning this publication and he did not deny that he had given the information to the correspondent, but he wrote me, this time in French:—

“Le correspondant de ces deux journaux, qui se fût de la matière de la trachéotomie au fond, croyait peut-être pacifier les esprits agités par les nouvelles, en exprimant d'une manière circonspéctue en disant sur ce sujet.”

“Small hemorrhages are not uncommon in such cases; possibly the cannula did not fit perfectly, and will be changed.”

As in this matter, so were almost all professional questions rendered difficult, because before any subject had been discussed among the physicians—often, indeed, before it was brought before them—the Royal Family had, upon the august patient himself had been informed about them, and the matter determined. Mackenzie, his views being rendered acceptable by his references to his numerous experience. Nor did the general medical treatment suffer less, for although Mackenzie certainly left to Bramann and to me the surgical after-treatment of the tracheotomy wound, he refused to recognize that we were also entitled to be consulted with regard to any treatment which was applied to the larynx. So, in the morning consultation of the 17th of February we learnt from him that on the previous evening a laryngoscopic examination had been made, and that by this the absence of every trace of blood from the interior of the larynx had been ascertained. Soon afterwards the already-mentioned Berlin newspapers published the statement that Mackenzie, by this examination, and on closing the cannula the Crown Prince was able to speak better than before the operation. Upon this I made to him (Mackenzie) energetic representations, and urged upon him in the most definite way not to proceed any longer by himself, but only in conjunction with the other physicians associated with him in the management of the case. With my opinion as to the origin of the mucus and bleeding, I must at present oppose as dangerous every endeavour to increase the expiratory efforts of the patient through the larynx. Only the most absolute rest could possibly still check the tissue destruction in the interior of the larynx. Nevertheless, Mackenzie absolutely maintained that the larynx of the astatic patient must remain the object of his exclusive attention. This determination found the strongest expression in the subsequent consultation with Professor Kussmaul, whom he had accepted without remonstrance—nay, as it seemed, willingly. He wrote at that time (that I only asked the consent for Professor Kussmaul to make an examination of the lungs, . . . I am ready to admit that Professor Kussmaul, who is a better auscultator than I am, I shall be glad to learn his opinion as to the state of the lungs, but I cannot admit that he is a laryngoscopist of the same standing as myself.)

“This was the explanation of his absence from Kussmaul's first visit. It required repeated representations and the graciously-accorded intervention of

her Imperial Highness the Crown Princess in order to induce Mackenzie to permit what until the present time has been held to be the undisputed right of every physician called to a consultation—namely, to make a complete examination of the patient. At Kussmaul's second visit Mackenzie appeared and assisted in the laryngoscopic examination. We had already at one of our consultations agreed to administer a few drops of opium on account of inter-current diarrhoea. When I soon afterwards went into the sick chamber I saw the attendant of the august patient administering to him a tablespoonful of another mixture. "Lactosolium solution." To my question, "Why not the opium drops?" I was told that Dr. Mackenzie had otherwise determined. Not even in this respect was he able to adhere to the decisions of the consultations.

The quantity of the expectoration varied extraordinarily. There were sometimes, chiefly in the morning, from 4 to 6 hours without cough; then, however, came paroxysms of very severe coughing, lasting sometimes several minutes, which forced out from one to two cubic centimetres of pus and offensive sanious fluid into the gauze compress; or so filled the inner canula that this required to be immediately changed. We submitted to thorough microscopic examination a sufficient quantity of this expectoration, which we had obtained on the 16th of February. We found under the microscope besides globules of pus and blood, numerous spherical bodies, which contained unmistakably concentrically arranged epithelial cells, and conical bodies, which consisted of large pavement epithelial cells, closely packed together. In some preparations there were also many elastic fibres.

"On the 12th of February Sir Morell Mackenzie had written as follows in the eighth number of the *Berliner Klinische Wochenschrift*:—"In my opinion the clinical symptoms were always reconcilable with a conglomant, disease, and a microscopic examination was in agreement with this opinion." And, again:—"At this moment medical science does not permit me to assert that any other disease is present than a chronic inflammation of the larynx, combined with perichondritis. Before the present case I had printed these words, the most complete scientific proof in opposition to this opinion of Mackenzie's was obtained by the same surgeon, whose positive clinical diagnosis had so long been doubted in the summer preceding."

"On the 16th of February, when we were possessed of a sufficient number of these microscopic preparations, I invited in the first place Dr. Krause, and through him the two English physicians, to convince themselves of the results of my microscopical examination. Krause, in opposition to a freshly prepared different demonstration, declared himself to be convinced. Mackenzie, however, informed us through Krause that he did not consider himself competent to give an opinion on a microscopical question. In England it was thought essential to leave such questions in the hands of anatomists."

"To us the anatomists were not necessary. We had before us that proof of the dignity of the laryngeal disease which alone Mackenzie had required; namely, the anatomical. Cancer nests were found within and between bundles of elastic fibres and in portions of muscle fibres, so that they came from the deeper parts and not from the surface. The development and course, as well as the clinical appearances, of the new growth, together with the possibility of excluding every other disease which could resemble cancer of the larynx, had been to us a sufficient proof of the correctness of our diagnosis. We had never been able to comprehend the standpoint of a physician who holds that his diagnosis only affords a right to determine his treatment when it has been verified by the knife of the anatomist—a standpoint which in its extreme consequences would leave the physician in the wake of the post-mortem examination. However, even these eccentric requirements were now fulfilled; every day afforded us new preparations, every day convinced us through their means of two things—first, of the diagnosis of cancer; secondly, of the disintegration of the new growth. The longer this continued, and, therefore, the more pieces of necrosed tissue with coagula were

present in the expectoration, the more abundant appeared also the elastic fibres and muscular fragments, which, lastly, on the 24th and 28th, included fragments of cartilage recognizable by the naked eye.

"Mackenzie, however, continued to assert that nothing but my canula was to blame for all these distortions. He complained to the august family of the patient that I resisted him, and he said that the employment of my canula, closed towards the larynx, was an impediment to the further treatment of the laryngeal affection. He asserted that as soon as the introduction of his canula was conceded, all the threatening appearances, and among these especially the admixture of blood, would disappear. At the same time it would then first become possible to use the essential measure of the introduction of healing powders and other medicaments into the larynx. The laryngoscopic examinations which I, in the third week after the operation, made three times with Mackenzie and the other physicians, showed the entrance to the larynx completely filled by two thick swellings, so that when the canula opening was closed with the finger scarcely a bubble of air could escape through the small slit between them in expiration; whence the loss of voice of the august patient. For the same reason the pus and the cancerous liquid were not able to ascend into the cavity of the mouth, but were compelled to descend down the air tube and around the canula. In these circumstances, and since in the meanwhile a canula of suitable width, 12 millimetres in diameter, had been obtained from London, I proposed to Mackenzie himself to make an experiment with his canula. It was introduced on the evening of the 20th of February. It differed from those previously employed in that it was bent at a right angle, and consisted of a rigid horizontal and a distal vertical portion. By means of a screw, the horizontal portion could be shortened or elongated according to requirement."

"The night after the introduction was better than the preceding. There was less expectoration and less blood, and hence it is intelligible that, on the morning of the 21st, in the telegram to the papers whose correspondents, as has been officially announced, were received by Mackenzie at the Hôtel Victoria immediately after the common morning visit, it was asserted that the irritating cough and the bloody expectoration had ceased since the introduction of Mackenzie's canula. The *Standard*, which the day previously had written:—"The condition of the larynx is satisfactory, but that of the windpipe serious, thanks to the error of the German surgeons in the choice of the canula and the treatment of the wound. The *Standard*, which had written that, published now the following:—"Sir Morell Mackenzie protested against the canula as soon as he saw it, and warned the physicians against its introduction, because it would irritate the Prince's windpipe. They, of course, clung to their opinion, and would not listen to his counsel. The canula was introduced; after one or two days, as Sir Morell protested, the Prince coughed up mucus mixed with blood, since the lower end of the canula, which came in contact with the mucous membrane, had eroded it. This condition lasted from Thursday, the 9th, to Monday, the 30th. During all these tedious days the Prince coughed; his cough was very tormenting, especially during the night, and his sleep was so much disturbed that even the Germans began to doubt their own wisdom. The same evening the German physicians yielded to the Prince's canula, and permitted Sir Morell to introduce his own. This is the second phase of the case, and what was the result? The night brought a refreshing sleep, which the German physicians themselves had to recognize in their bulletin." On the 25th of February followed the *British Medical Journal*.

"The Crown Prince is now beginning to make satisfactory progress; the cause of the unfavourable local symptoms mentioned in the bulletins published at the beginning of this and the end of last week was mainly mechanical. The tube at first inserted into the larynx did not fit well. . . . This difficulty, we now learn, has been overcome; a tube of large calibre, specially constructed in this country, has now been adjusted, and the



irritation produced by the ill-fitting tubes has passed away."

However, the *British Medical Journal* was in error. On the 25th of February the facts were quite different. The good night of the 20th and 21st was followed by a less favourable day; in the afternoon there was much coughing, as well as on the following nights and days. I ascribe this to the use of the insufflations of ultrate of bismuth, tannin, and morphia powder had produced irritation. The expectoration remained brownish and abundant, and, moreover, contained more fresh blood than before. On the occasion of a minute examination of the wound, Howell ascertained that it was in the middle line, and that consequently the cannula must press and irritate, the oblique position of the wound having thus to bear the blame of the irritation, which continued even with the use of the English cannula. This statement immediately appeared in a series of English and German journals. It was repeated in the most drastic form in the *World*—"The true cause of all the trouble was this—that the tracheotomy was performed in an exceedingly clumsy manner; the operator lost his head and made a long incision in the neck, instead of a small incision, which alone was necessary. He was so nervous that he had great difficulty in finding the windpipe, which he finally opened far too much on the right side instead of in the middle. No wonder, therefore, that he occasioned so much difficulty in obtaining a suitable tube." Even the *British Medical Journal* placed itself at the service of Howell's assertion about the lateral incision. In its number 1,419, we read:—

"We may repeat that the recent sufferings of the illustrious patient have been almost wholly due to the irritation caused by an ill-fitting tracheotomy tube. The operator, as was perhaps natural under the circumstances, appears to have been rather nervous, and the windpipe was opened some way to the right of the middle line; hence the difficulty of finding a suitable tube. Thus, Dr. Mackenzie, assisted by Mr. Howell and Dr. Evans, the well-known dentist of Paris, spent the greater part of one day in constructing a tube of a shape specially adapted to the requirements of the case. Since this has been worn the Crown Prince has been more comfortable in every way; he has been able to sleep, the cough has diminished, and the expectoration has almost lost the blood-stained character which excited so much alarm."

"But this favourable condition of the expectoration, as the following report will show, was a attained up to death."

On the 4th of March and on the 16th of April Professor Waldeyer discovered the same admixture of blood, and the same necrosed shreds, in the expectorated masses which we had found from day to day. The night between the 23d and 24th of February was especially unfavourable. The quantity of the admixture of blood was becoming remarkably large. It even gave me the suspicion of a hemorrhage from the lungs, as if a softened secondary cancer nodule had formed in these organs. As Surgeon-Major Dr. Schrader had been watching during this night, Sir Morell dared to assert that his unskilful hands had occasioned the alteration for the worse in changing the inner cannula. This episode also found its echo in the *Standard* and other journals. As it there reads:—"If Dr. Howell had been permitted, not only to come twice in a night in order to replace the cannula correctly, but also to sit up with the Prince, nothing would have been heard of disturbed rest." In fact Mackenzie demanded that only Howell and himself should sit up, as then the new cannula would be properly employed.

"His wish was granted, but the expectoration was still more abundant and the admixture of blood more striking."

"Mackenzie concealed this himself, for on the morning of the 24th he apologized to Schrader, and told me, in the presence of the other colleagues, that he had convinced himself that his cannula irritated no less than mine. He would yet make further alterations, in order better to meet the existing conditions, and until then I might again introduce my instrument."

"The state of the angust patient underwent no change, although the most various powders were blown into

the larynx from the wound, or through the opening in the upper wall of the cannula. There were now and then hours of sleep, and tolerable days, during which his Imperial Highness took walks in the garden, or sat upon the balcony. As the general good condition was but seldom disturbed by a slightly higher evening temperature and by headache, the appetite remained satisfactory. He was now and again disturbed by pains in swallowing, which radiated to the left temple and the neighbourhood of the ear.

"The abundant expectoration led me, although I could ascertain little by percussion and auscultation, to think of the possibility of an infection of the lungs. The sputa had somewhat the appearance of raspberry-jelly, and the angust patient frequently complained of stitch below the left collar bone and over the whole left side of the chest. As a gangrenous process had been going on in the larynx since January, there must have been during the same time a descent of the products of decay into the air passages, so that the development of a putrid bronchitis and of peribronchial foci, was therefore daily to be expected. The degeneration of secondary cancerous nodules in the lungs appeared to me to be still more probable. I brought these views before my colleagues in the consultation of the 24th, pointing to the compresses which had covered the opening of the cannula during the night, and which were saturated with brown and raspberry-coloured expectoration. If my views as to the lung infection were correct, a rapid tendency to become worse must be expected, and hence I expressed a wish for the calling in of an internal physician. Another reason for this was that in my opinion, after the establishment of the diagnosis of an already far advanced perishing cancer, no special care for laryngeal diseases was no longer of the right place; and, the patient being threatened with general consequences, an internal physician ought to be put in charge of the treatment."

"The summoning of Kussmaul was unanimously recommended by the physicians of the Imperial family, and was at once approved of. By command, I telegraphed the same hour to Strassburg."

"On the 26th of February Privy Counsellor Dr. Kussmaul arrived. He reports the results of his examination as follows:—

"By the command of her Imperial Highness the Crown Princess of Prussia and of the German Empire I started on the 24th of February of this year for San Remo, where I arrived on the evening of the 25th. Here I saw in the first instance Professor von Siegmund, by whom I was told that I had been summoned in order to examine the chest of his Imperial Highness the Crown Prince, and as far as possible to ascertain from whence the red expectoration was derived, which his Imperial Highness had coughed up through the cannula since the completion of the tracheotomy, and especially whether it proceeded from the lungs. Early in the morning of the 26th of February I received about 100 grammes of the sputa which had been coughed up during the previous night. The greater quantity was red or raspberry-coloured, and appeared like mucus almost uniformly mixed with blood. A single mass had a grayish colour like that of pus passing into degeneration. This sputum was recognized under the microscope as pus, without any admixture of tissue. The red mucus contained numerous masses of mainly of blood corpuscles and pus corpuscles, mingled with numerous pigment granules, with isolated and combined pavement epithelial cells of varying appearance, with globular transparent cells, and with solitary nuclear spheres; in a single preparation I found healed up in great abundance the so-called epithelial or canceroid pearls, some of them rounded, others more elongated. Of these I counted more than a dozen in a small microscopic object."

"I was informed by Dr. Brannmann that he had found similar pearls daily during the last 12 days in the red expectoration, except on one day only, when the examination was prematurely interrupted. He showed me a number of preserved preparations, in all of which such pearls were present in varying quantity. Moreover, he had kept two preparations, which con-



bandages, they were arranged more in the manner of **snides**.

"About 9 o'clock I had the honour to be received by the Crown Princess, and soon afterwards by his Imperial Highness. I had seen the Crown Prince during the quinquenary jubilee of the University of Heidelberg, then in blooming health and strength. He now appeared to be emaciated of a sickly count of skin, but the expression of his face retained unchanged its former winning graciousness. It may be that the Crown Prince was looking more ill than usual, since during the last few days he had suffered from diarrhoea, which had disturbed his rest at night; and his appetite was bad, so that he could take no solid food. Finally, he was distressed from time to time by coughing, but feverish irritation was only present in a very small degree.

"His Imperial Highness had suffered previously from constipation. The diarrhoea, which furnished only soft but not fluid evacuations, was produced, as Dr. Schrader assured me, by his having drunk porter.

"I proceeded to the examination of the chest after I had first felt the pulse and neck. The pulse was a little quickened, but not remarkably. In the neck, and particularly over the larynx, I could not discover any considerable swelling; but on the left, near the larynx, I thought I could feel a small swollen, deeply-seated lymphatic gland. The wound around the opened trachea appeared well cicatrized; the mucous membrane of the posterior wall of the trachea, as far as it could be seen, was only slightly injected, and was not ulcerated.

"The movements of the chest in respiration occurred in uniform and regular course, as in healthy lungs. Frothing gave everywhere normal results. In auscultation I heard on both sides, down to the margins of the lungs, loud, clear, vesicular breathing. Only posteriorly and above, in deep breathing, was there some weak bronchial respiration. I could not discover left pleurisy; but, behind, in the upper part of the right lung, I heard occasionally some inspiratory crepitation. The frequency of breathing during the last days had ranged from 20 to 23.

"Dr. Mackenzie was not present at this examination. He had expressed a wish that I should only be allowed to examine the chest, and not the larynx. I went to him and obtained his consent that I should make a laryngoscopic examination in his presence. This was done at 3 o'clock in the afternoon. I saw only this—that the epiglottis was not thickened, while behind it, in the region of the arytenoid cartilages, there were two flattened hemispherical bodies, which would not allow me to see into the interior of the larynx.

"On the 27th of February I again examined the expectoration with Dr. Braunmühl. It had consisted during the night of only a few reddened mucous spits, with no pus. Among many preparations carefully examined for epithelial pearls, I found a great number of them only in one. To-day also the Crown Prince permitted me to examine his chest. I found, as on the day previously, everything normal. Only once I heard transitory rouschus at the posterior part of the right lung, between the scapula and the spine.

"Considering these results, I came to the conclusion that the red expectoration did not proceed from the lungs or the bronchi. The grounds for this conclusion were as follows:—

"1. Beyond an occasionally audible crepitation and isolated rousch, the examination of the chest showed nothing abnormal. To these symptoms no importance could be attached; we must rather be surprised that in a patient who had been subjected to tracheotomy such sounds were not heard more frequently and more abundantly. They are naturally to be explained by the presence in the deeper air tubes of mucus which has descended from above.

"2. The blood-tinged mucus, which for 14 days has been coughed through the cannula, twice contained elastic fibres. These did not show the alveolar arrangement of elastic fibres, which would proceed from abscesses or cavities of the lung. In one of the preparations the fibres appeared unravelled and tangled; in the other, which contained them in remarkable

network of elastic fibres, which certainly proceeded from an ulceration. Their whole arrangement showed that they did not come from the lungs.

"3. Moreover, in this mucus, epithelial pearls have been found during 13 out of 14 days. Since these had been expelled during so long a time, and in considerable number, I considered the opinion to be confirmed that we had before us an ulcerating new formation—tumour of epithelial character.

"4. This tumour could neither be in the lungs nor in the bronchi. This was shown not only by the described arrangement of the network of elastic fibres found in the expectoration, but also by the absence of any physical symptoms indicative of disease of the chest organs. An ulcerating tumour in the lung or bronchi, which constantly yielded bloody spits with elastic fibres and abundant epithelial pearls, must produce, in any part of the chest, some symptoms of obstruction or occlusion of the bronchi, even if not a condensation or formation of cavities in the lungs. There would be at least somewhere a limited weakening or alteration of the respiratory sounds—whistling, rales, and the like, to be discovered.

"5. Since, moreover, the tracheoscopy performed by Dr. Mackenzie showed no lesion of the windpipe, no ulcer, and no swelling from which the blood-tinged expectoration could proceed, so there remained only the larynx in which to seek the seat of the bloody mucous secretion, the ulceration, and the cancerous tumour. The mucus from the larynx passed downwards between the cannula and the walls of the windpipe, and was then coughed up through the cannula.

"I did not conceal from Dr. Mackenzie that I considered the tumour in the larynx to be a malignant epithelioma. He did not dispute the possibility of this inference, but did not admit the complete certainty of my diagnosis. If I rightly understood him, he thought that there might be an epithelial formation of a benign nature, complicated with deep ulceration of the laryngeal mucous membrane, and with perichondritis. It is not known to me that such complications have been observed in benign epithelial tumours. The whole progress of the disease offered nothing in support of his conjecture."

The last-mentioned difference of opinion between Kussmaul and Mackenzie has again shown that the latter adhered to his view of the non-carcinomatous nature of the new growth. But he had declared that if an authority such as Virchow should recognize the proof furnished by the preparations of von Brunnmann and Braunmühl, he would admit himself to be convinced. Virchow was at that time in Egypt, and was therefore not accessible; we were compelled to seek another authority. By this time the lodge-podge of experiments with cannulas of different curvatures, and covered with a layer of fine caoutchouc, had so far led to unanimity on the cannula question that Mackenzie had declared himself satisfied with the one last employed. Moreover, the wound around the cannula had been for some time cicatrized.

"I therefore regarded my duties, which had relation to the conduct of the surgical after-treatment, as terminated; and I pledged myself, on my approaching return to Berlin, to take with me the preserved preparations and to lay them before Professor Waldeyer as a universally recognized authority in the history of the development of cancer. Mackenzie declared his agreement with this proposal, and promised to yield to Waldeyer's judgment. On the morning of the 28th of February I was in the most gracious manner dismissed by the august patient, and was about to commence my return journey, when I was detained in San Remo by a telegraphic command from His Majesty the Emperor and King. His Majesty desired that I should await the coming of his Royal Highness Prince Wilhelm, who would arrive on the morning of the 2d of March, and that I should endeavour to obtain a binding promise concerning the speedy return of the august patient to Berlin.

I saw only one way to the fulfilment of the definitely expressed wish of His Majesty, and that was by convincing Mackenzie of the correctness of the diagnosis of cancer. I believed that he would then offer no oppose resistance to the return journey, which need not be immediately to Berlin; but in the first instance to Baden-Baden or to Wiesbaden. I therefore, through

the good offices of the Imperial Physician in Ordinary, Dr. Leuthold, requested Waldeyer to come to San Remo. Professor Waldeyer arrived on the evening of the 3d of March, and on the following day instituted most careful examinations, the results of which afforded the most complete confirmation of our opinions of the microscopic characters of the combined masses.

The opinion of the Middelplein Privy Councillor, Professor Dr. Waldeyer, was given as follows:—

"In consequence of the request of Surgeon-General Dr. Leuthold, Physician in Ordinary to His Majesty the Emperor and King, I left on the 1st of March of this year for San Remo, in order to examine the materials expectorated through the cannula, which was worn by his Imperial and Royal Highness the Crown Prince of the German Empire and of Prussia, as well as to examine the microscopic preparations of the same objects which had been made by Drs. von Bergmann and Bramann.

"On the morning of the 4th of March of this year I obtained from these gentlemen, the physicians in charge of his Imperial and Royal Highness—

"1. A number (about a dozen) of microscopic preparations preserved in glycerine.

"2. A portion of the expectoration of the night between the 3d and 4th of March, in a glass vessel.

"3. On the morning of the 5th of March, a portion of gastric lavage, with the masses shortly before ejected through the cannula.

"1. The above-mentioned microscopic preparations were for the most part tinged with Bismarck brown in order to colour their nuclei, which colouring I recognized as very successful and appropriate. As microscopically recognizable constituents I saw therein, besides masses of detritus, microbes, pus cells, and red blood corpuscles—(a) concentrically stratified cells, of the character of pavement epithelial cells, united to round and longish corpuscles; (b) isolated large cells of the same character; (c) (in some preparations) fine, sometimes dark, sometimes bright, fibres; (d) scattered dark granulated cells, the so-called granule cells. The concentrically stratified bodies indicated under (a) were sometimes isolated, sometimes heaped up to the number of ten or more, among detritus masses, pus cells, and blood corpuscles. The cells ~~at~~ the periphery of the stratified bodies were flattened and arranged like the layers of an onion, while in the centre one or more roundish, sometimes bladder-shaped, glistening cells were discoverable. Two or three or more of such bodies were often seen arranged in a row, like pearls, enclosed in a layer of concentrically-arranged flat cells of the same kind as the cells on the periphery of the isolated roundish bodies, and united into a larger elongated structure of conical form. The conical structures were sometimes further ramified. By gentle pressure, or by teasing with needles, the component parts of the above-mentioned roundish and elongated bodies could be isolated. It was then easily seen that the bodies were mostly composed of large flat cells of definite boundary; almost in every cell a nucleus tinged with Bismarck brown could be discovered. In uncoloured preparations the nuclei could also be recognized without any doubt. The cells possessed, according to appearance, size, and in their refraction of light, all the character of pavement epithelial cells, such as those of mucous membranes which are covered by pavement epithelium, among others, the membranes of the true vocal cords of the larynx, and such as are present in these cancerous growths which have been called pavement epithelial cancer or carcinosarcoma.

"The number of these pearls and cones was exceedingly great; they were hardly absent from any preparation, either in those of Drs. von Bergmann and Bramann, or in those freshly made by myself. As I observed, they were frequently heaped together in foci, and twenty of such bodies might in several preparations be counted in the field of the microscope, under an enlargement of 100 diameters.

"The isolated cells mentioned under (b) showed the same constitution, and could be distinguished from pus cells without difficulty. The fibres mentioned under (c) in some instances (according to the statement of Dr. Bramann—in the preparations made by himself from

the fresh expectoration they were not present) were unaltered by the addition of acetic acid; this character, as well as their strong refraction of light, and their partly crinkled and partly stretched and isolated course, allowed them to be recognized as elastic fibres. The position and arrangement of these fibres never showed anything typical or constantly recurring; such as the arrangement which they would have possessed if they had formed the boundaries of small roundish cartilages.

"Another portion of the fibres had a more wavy arrangement, were united together in small bundles, and showed a weaker refraction of light. These must be regarded as connective tissue fibres.

"The granule cells mentioned under (d), the microbes, and the pus cells, are present in almost every expectoration from the air tubes, and do not afford any characteristics for an opinion. On the other hand, the considerable admixture of red blood corpuscles which I found in every preparation appeared important.

"The fresh masses which I examined (on the 4th and 5th of March of this year) were of adhesive consistence, and of predominating bloody colour, in which isolated grayish yellow purulent points were conspicuous. No firm fragments could be discovered among them with the naked eye, neither by teasing with needles, nor by diluting them with fluids (distilled water, diluted acetic acid, diluted liquor potassae, glycerine), save for one easily-to-be-explained exception. The microscopic examination gave the same results as in the preparations placed before me by Drs. von Bergmann and Bramann. Only it must be remarked, that the numerous red blood corpuscles were almost entirely unchanged, as if they had just issued from a blood-vessel, and that, as already remarked, fibres were absent.

"In the portion of expectoration which I found in the gastric lavage there were, indeed, particles, the size of a lentil, of irregular, angular formation, which I recognized both by the naked eye and under the microscope as hyaline cartilage.

"In every section through this fragment one surface was found even, and covered with tangled connective tissue and elastic fibres. On this surface the superficial layer of cartilage cells were flattened and parallel to the surface. The other surfaces appeared finely eroded, and were thickly covered with gaps and excavations, like the so-called Howship's lacunae of bone tissue. In these gaps I found detritus masses and round cells, with which also large objects resembling epithelial cells were mingled. At one point these epithelial cells were lying in a roundish heap.

"From the above-described observations, taken together with the fact that the masses were obtained from a cannula in the windpipe, I drew the following conclusions:—

"1. The concentric bodies (onions, pearls, or cones) are unquestionably the so-called 'caneroid bodies,' and proceed from a cancerous new formation. The grounds for this are—first, their composition; second, their size and form; third, their great number; fourth, the impossibility that in the case before us they could proceed from any normal formation, or from any other pathologic product.

"2. The cancerous new growth must be seated in the air passages, assuming that the air passages are not in communication with any cancerous structure situated elsewhere.

"3. The cancerous mass is probably situated above the cannula in the larynx.

"The grounds for this are:—(a) the composition of the pearls and pavement epithelial cells, in view of the experience that cancer of the air passages commonly has its origin in the pavement epithelial cells covering the vocal cords. (b) The fact that no alveolar arrangement of the elastic fibres has been discovered. Such an alveolar arrangement would lead to the belief that a new formation might be situated in the lungs. (c) The fresh condition of the intermingled red blood corpuscles, although this circumstance could not be considered decisive. (d) The size of the pieces of cartilage contained in the expectoration of the 5th of March. It would be difficult to obtain a piece of such size from a bronchial or tracheal cartilage, as all

three of its dimensions were equal.

"4. An extensive ulcerative and necrotic process of destruction must be present in the cancerous new formation. This process has also extended to the larynx.

"The grounds for this are—(a) The presence of so large a number of isolated cancerous bodies, with detritus, pus, and blood, in the expectoration. (b) The presence of elastic and connective tissue fibres in Bramann's preparations. (c) The presence of absorption cavities in the before mentioned portion of cartilage.

PROFESSOR VON BERGMANN CONTINUES :—

"I brought Mackenzie to Waldeyer that he might explain to him, in the most express manner, and might demonstrate from the preparations the presence of absorption microscopic appearances in support of the diagnosis of cancer. Mackenzie again declared, as on the 9th of November, that he entertained no further doubt as to the presence of cancer. I then pressed him with regard to the return journey, and was so fortunate as to obtain from him the following promise, in writing :—'I, the undersigned, hereby promise that on the occurrence of more severe symptoms in the disease of His Imperial and Royal Highness, I will press for his speedy return to Germany, which in any case I should recommend on the arrival of a warmer period of the year.—MORELL MACKENZIE.' In a subsequent medical consultation I imparted the result of Waldeyer's examination, and the recognition of the same by Mackenzie. Since complete agreement now existed among the physicians with regard to the diagnosis, I endeavoured to apply this to the most important question of the treatment. Mackenzie had recently obtained another new cannula from England. It was constructed on the same principle as that which he first brought into use and introduced on the 20th. This, however, was somewhat longer and broader, and no longer rectangular, but bent in an obtuse angle, so as to be more like our own. I declared my consent to its being employed, but with the proviso that for the future the previously existing frequent changing and trying of new cannulae should be abandoned, as well as the insufflation of pulverized and cauterizing medicines into the cavity of the larynx, or, at least, that they should be reduced to a minimum. As we had come to an agreement upon all these points, and as Mackenzie himself had asked me to leave Bramann behind for any surgical emergencies which might occur during my absence, I could make my preparations for departure. The outcome of this, our last consultation, was the issue of the bulletin of the 6th of March, which received such different interpretations.

"'The undersigned declare that, with regard to the nature of the disease of His Imperial and Royal Highness, no difference of opinion exists among them, and that no immediate danger is to be expected from it. The sole responsible conduct of the treatment is left, before the operation, in the hands of the undersigned Sir Morell Mackenzie.'

"It had been my proposal, since the august patient had so often been assured that the physicians had agreed on the 9th of November, and that he was suffering only from a laryngeal disease which could be cured by tracheotomy, to keep the contents of Waldeyer's opinion private; and for doing this I was thanked by Mackenzie. As a matter of fact, until the most recent visit, the Press knew nothing of our and Waldeyer's positive anatomical diagnosis. The journals interpreted the bulletin as a recognition of Mackenzie's favourable views.

"The serious event which took place on the days succeeding the 5th of March was well known. On the morning of the 10th of March the Emperor Frederick commenced his return journey, and arrived on the evening of the 11th in the Castle of Charlottenburg.

"Eight days after the return of the Emperor I was summoned by a letter from the Physician in Ordinary, Dr. Wegner, to examine and to take part in the treatment of His Majesty, after the responsible conduct of the case had, by an Imperial command, been given exclusively to Dr. Mackenzie. My first visits were on the 18th and 26th of March. I examined

the larynx by good sunlight. The epiglottis was still free, but the swelling in the region of the left ary-epiglottidean fold had become larger and higher, and an ulceration existed on its median side. Looking into the cavity of the larynx was not possible. The external thickening of the larynx had unmistakably increased, there was a hard infiltration along the trachea from the cricoid cartilage to the upper margin of the thyroid canal in which the cannula was placed, and laterally surrounding the cannula. Only the lower portion, between the cannula and the breast-bone, was free. The expectoration and the attacks of coughing were just the same as at San Remo. Especially on the 25th of March, there was a large quantity of sticks in the expectoration in the bandage. On the 29th a large piece of cartilage was expelled, and some days afterwards several pieces of necrotic tissue. This gave occasion to the reporters, who derived their inspiration immediately from the Castle of Charlottenburg, to speak about a buccal crisis in the course of the disease. The dead piece of cartilage was regarded as an evidence of the presence of perichondritis, and was made a ground for a return to the diagnosis so often previously given. More and more frequently in this and in the following weeks Von Wegner's notes speak of headaches, against which, as at San Remo, croton, chloral, and morphia were administered. Eight days later, on Easter Sunday, I felt below the cannula a manifest lump, and an increased hardening existing laterally under the skin. On the left this extended to the hollow above the collar bone, while, had swollen lymphatic glands were to be felt beneath the middle of the sternomastoid muscle. Hence it happened that the whole of this region formed a projection on the summit of which rested the shield of the cannula. The granulations, when removal of the cannula formed the walls of the wound canal appeared, especially in the upper part of the wound, very irregular, dirty gray, and covered with excoriations, in which coagula the size of a millet seed and larger were studded; everywhere were yellow points and shreds, which I was able to pick away with forceps. An attack of coughing which I witnessed was exactly like those at San Remo, and at its termination about five cubic centimetres of brownish sanious fluid were expelled at one time. I took this and examined it in conjunction with Professor Waldeyer. It precisely resembled the similar masses in San Remo. Indeed, every microscopic preparation displayed a quantity of canceroid pearls. The process of disintegration was manifestly increasing.

On the 8th of April I found the skin above and on the sides of the cannula, replaced to the height of five millimetres by yellowish red formations, resembling proud flesh. Parts of them were dark brown, manifestly gangrenous, other parts dotted with blood. Their hardness and the deep fissures between them characterized them as fungating cancerous masses—an impression which Mackenzie rejected in the words, "This is certainly not cancer, but merely wound granulations."

"I declared myself certain of the correctness of my opinion, since the hardened infiltration descended still lower towards the suprasternal notch, and the cannula was pushed up above the level of the new brownish coloured and adherent skin by the increase of the tumour masses lying beneath it. The cannula which at this time Mackenzie used consisted of a straight, smooth, silver outer tube, about four centimetres long in which by means of a strong pilot the inner tube was inserted, this being about six centimetres longer than the external. Beyond the latter projecting part it was flexible, and was constructed of joints on the well-known principle of the lobster's tail. The external movable part of the windpipe, and then within this the interior of the windpipe, and then within this the interior of the inner tube hung down. Manifestly it was intended in this way to prevent any contact with the walls of the trachea. I took the liberty to point out to Mackenzie the shortness of the shortness and straight direction of the external tube, this might easily be pressed out of the wound by the rapid increase of the tumour. The only security

against this would be afforded by the employment of a curved double cannula which would reach deeply into the calibre of the trachea. My advice was not considered by the responsible and acting physician.

On the morning of the 12th of April the sick attendant, whom I had previously installed at San Remo in charge of the august patient, informed me that the previous night had been very bad, the introduction of the inner cannula did not succeed, and the Emperor's breathing had been extremely difficult. I imparted this to my assistant, Dr. Bramann, and asked him to hold everything in readiness for the eventuality of greater difficulties in the introduction of the cannula, such as I had foreseen on Sunday.

As I had anticipated, about 3 o'clock in the afternoon, I received from a Royal despatch-rider, who did not find me at home, but at a consultation at an hotel in the town, the following letter from Mackenzie:-

"Dear Professor von Bergmann,—We have difficulties with the cannula, and I shall be glad if you will see the Emperor with me as soon as possible.

"Yours truly,

MORILL MACKENZIE."

The last four words were underlined.

I started immediately with Dr. Bramann, only calling at my house in order to obtain some instruments. My servant had already been questioned through the telephone from the Royal Castle to hurry the despatch-rider had found me. I found him in a hurry. I had scarcely started when there was another telephonic inquiry whether I was on the way. I was received by Surgeon-General von Wegner, and heard from him what he had written in his journal:—"The night was restless; in the morning oppression of the chest; on removal of the cannula the breathing was easier, and also after another shorter cannula had been introduced. From one o'clock in the morning and in the course of the day difficulty of breathing. The cannula then in use projected forwards, as the attendant Beerbaum had already observed during the night. The breathing was greatly impeded." It will certainly not yet have been forgotten by many that Mackenzie, in his reply to the *Kölnische Zeitung* in respect of its account of the proceedings of the 19th of May, asserted that on the morning of this day neither he nor the German physicians present at the consultation had observed any disturbance of the breathing, and that they were prepared to support him in this statement. Well then. Here lies before us a testimony written but an hour later which does not speak in favour of Mackenzie.

Conducted at once to Mackenzie, I found him in the Emperor's ante-chamber with a workman from Windler's instrument-manufacturer, employed in so bending a leader tube that it might be carried deeply into the trachea. He had intended in this way quickly to prepare a curved cannula. I showed him that I had a Hahn's sponge cannula, which presented exactly the curve which he also now recognized as suitable, and I immediately removed the sponge from it. Mackenzie agreed to the proposal to introduce this, and hurried with me to the Emperor. I was shocked when I found the august patient sitting upon a stool in a state of suffocation; his cheeks and lips were blue, there was a stidor in his inspiration which could be heard in the next room, the inspiration was in the highest degree difficult, with tension of all the muscles, and with a drawing-in of the front of the chest clearly visible through the opened coat. I appeared to me that in a few minutes death from suffocation must ensue. I believed no time was to be lost, and desired an attendant, after I had asked and at once received Mackenzie's permission, to summon my assistant, Dr. Bramann, and proceeded to make an examination of the wound. Around the cannula the fungating masses, which in the meanwhile had become much higher and broader, were partly in larger, partly in smaller portions gangrenous, and the skin was everywhere tense over the deeper parts, so that the region of the neck in which the cannula lay projected like a short truncated cone. In the canal of the wound there was only the external cannula. To my question, when the inner-jointed tube had been no longer introduced, one of the attendants answered not since the early morning, Mackenzie added that several endeavours had been made to introduce it, but without success. Whilst even on Sunday, only

four days previously, I could see the posterior wall of the trachea in the depths of the wound, on this occasion I could not see it. Certain glubular excrecences pressed forward from the depths and closed the sides into the calibre of the wound canal, and completely concealed the way to the tracheal opening. The external tube only reached to the windpipe and did not enter it. I explained to Mackenzie that prompt aid—as necessary, and that, as he had not succeeded in introducing the cannula, the edges of the wound must be held asunder with large blunt hooks in order to reach the opening of the trachea, and that if this plan did not succeed, the opening in windpipe must be enlarged downwards with the knife. Mackenzie agreed with all I said, especially admired the long blunt hooks which I had brought with me. He placed himself immediately behind the august patient, supporting his head—a position which really could not allow me to think that it was his intention to introduce the cannula himself. I endeavoured to introduce it, but I did not succeed. The filling of the whole canal with the already-mentioned broad and much projecting granulations hindered me. I now laid the cannula aside and took the wound hooks in my hand. In the meanwhile Bramann had entered, and took charge of the hooks. Even now I made no advance with the cannula, while the difficulty of breathing of the august patient became ever greater and more threatening. I then endeavoured, after, as a matter of course, I had disinfected my hands in a basin near me filled with carbolic water, to remove the fungosities with my finger, and to reach the tracheal opening, in which to insert a wound hook. After I had done this and had the hook in my hand, Bramann introduced a somewhat less curved cannula, exactly the same which he had used in his operation on the 9th of February into the calibre of the windpipe. The Kaiser immediately breathed freely and easily, as he showed by joyful movements and by grateful pressure of the hands. My manipulation had certainly produced some bleeding, but it was only moderate. It is certain that some of this blood, as well as some of the broken tissue and of the sanities trickling down from the larynx, must have flowed into the trachea, but it was immediately coughed up again. With the introduction of the cannula the bleeding ceased, and when in half an hour afterwards I left the sick room with Wegner and Bramann, the sputa had already returned to the former brownish red colour. The whole procedure of the dilatation, and the introduction of the curved cannula, had only occupied some minutes.

However, by both Hüll and Mackenzie, a totally different account of this proceeding has been given.

Mackenzie had only summoned me out of politeness. I had pushed myself forward to introduce the cannula. In this not I, but only my assistant, had succeeded, and so on.

Certain English papers, and certain Berlin papers following, heaped upon me a mass of calumnies.

All of them in face of the fact that the Emperor, prior to my arrival, was in a state of suffocation, and that in a few minutes afterwards he was able to breathe freely.

It was not only I and my assistant who found the Emperor in a state of suffocation. On the same day His Majesty gave to the War Minister, General Broussard von Schellendorff, who was with him between 12 and 1 o'clock, the impression of gasping for breath, and of obtaining it only with difficulty. Two hours later General von Albedyll, who came to His Majesty with a report, believed that the Emperor would be suffocated in a paroxysm of coughing, and called for medical assistance. The same fear of approaching death by suffocation was shared by General-Adjutant von Winterfeldt, who, at 3 o'clock, urged upon me and Wegner that he should hasten the coming of Professor von Bergmann. All the valets of the Emperor declared they had from hour to hour since the morning seen the difficulty of breathing increasing in an alarming manner. Nay, when the Emperor himself said that I had not succeeded, he sent into the courtyard to see if I had not yet arrived.

I believe that even those who see in me only the unpolished man, who pushed himself forward against the will of the physician in charge, to perform an act which was then accomplished as roughly and clumsily as possi-

me, will not be able to shut their eyes to the testimony just quoted concerning the danger of suffocation; and that they will acknowledge this to have been relieved by me, after having remained unrelieved, as shown by the daily journal of the disease which is now placed among the documents of the Ministry of the Royal House, hold, for a period of 15 hours. I can leave it to the judgment of my profession to declare whether the mechanical removal of proliferating cancerous masses can ever have that influence which Mackenzie, in his last communication to the *Hilfsärztliche Deputation*, and to those placed around the Emperor, attempted to attribute to it, namely, a shortening of the life by six months! Modern surgery thinks just the opposite concerning much more extensive removals of cancers from canal-shaped organs. It considers them as beneficial acts, calculated to prolong life.

"Manifestly, not only had the degeneration of the cancerous masses in the larynx made very rapid progress during the recent time, but part of the convulsions which had sprung up above the skin around the cannula had also undergone the same changes; since, on the evening of the 12th of April, which I (as well as the following night) spent at Charlottenburg, I heard that the Emperor had already for six days been feverish. Friday, the 6th of April, after the august patient had felt especially dull and pulled-down, was the first day in which an evening temperature of 38°4 was entered in Wegner's journal. This evening temperature, with elevations, remained also on the following days, and amounted, on the 10th of April, to 38°7, according to Wegner's memorandum, to 38°2. The neighbourhood of the tracheal wound was more swollen, reddened, and sensitive. In the afternoon, after a drive, which was undertaken while the temperature was only 36°5, of Rössumers, there was a relapse. On Monday, the 8th of April, temperature 38°4; Tuesday, the 10th, morning, 38°2; evening, 38°6; and so on.

On the morning of the 13th, after a good night, the Emperor wrote that the night had been the best of the recent weeks, although a high temperature of 38°2 was present, yet on this day, on which I left the Castle at 10 o'clock, the august patient drove into Berlin in the morning, accompanied by Mackenzie. I had stringently advised that there should be no driving, and proposed that an account should be given of the successful change of the cannula should be given by means of a bulletin. But Mackenzie wished for no bulletin. He thought it better that the public should be quieted by showing the Emperor in Berlin. The drive was injurious to the august patient. Rigors again appeared in the evening, and on Monday, the 14th. On Sunday, the 15th, the temperature even of the morning had increased to 38°4. A bulletin issued previously to my arrival in Charlottenburg ascribed the fever to an inter-current bronchitis. The fever, frequency of breathing, and the weakness of the august patient, having increased on the Monday following, Medical Privy Councillor Professor Senator was called in. The antipyria which he ordered lowered the temperature to 38°5 on the morning of the 17th. At the same time the expectoration became more abundant. With the attacks of coughing there was often ejected at once a whole tablespoonful of brown sanioisy, mixed with much pus. I took away on Monday a portion of this. In the pus were no unusual constituents, but in each of the small brown shreds lying on the surface of the pus, canceroid pearls and coherent layers of pavement epithelium were to be seen.

On the same Monday Medical Privy Councillor Professor Leyden was also called to a consultation, and arrived on Tuesday at 10 o'clock. He, like Senator, found no disturbance in the lungs. At Mackenzie's desire we entered upon a discussion of the cause of the aggravation of the august patient's state. Mackenzie thought that externally to the trachea, perhaps in the mediastinum, some inflammation of cellular tissue must have become developed, and that, after the introduction of the cannula on the 12th of April. On this inflammation the fever might be dependent. In opposition to him, I showed the difficulty of disproving the existence of a small focus in the lungs. I considered the existence of such to be in the highest degree probable, since the cancer in the larynx had been undergoing ulcerative degeneration for some months, and the products of this

degeneration had flowed into the bronchi. The fetid smell of the breath, as well as the frequency of respiration, amounting to 44 in a minute, and the almost uninterrupted hiccough which had existed since Sunday evening, appeared to me to support the view of a putrid bronchitis. The more abundant expectoration I regarded as merely the increase and extension of the gangrenous ulcerative destruction of the tumour. Privy Councillor Professor Senator expressed himself in a similar manner. On Tuesday, the 17th of April, the fever had somewhat abated, and soon afterwards pus was expectorated in larger quantities. This circumstance was probably the reason why Mackenzie now remained convinced of his opinion that a large abscess in the cellular tissue around the trachea had perforated into the air tube. The *British Medical Journal* ascribed the abscess, and had no doubt as to its etiology, as it wrote in its number of the 28th of April:—

"From information we have received from a trustworthy source we have reason to believe that a false passage was made in replacing the tracheotomy tube, as this operation was followed by considerable hemorrhage; and if it can, we are informed, be clearly proved that neither of the Emperor's English medical attendants was responsible for this unfortunate occurrence.

"In the meanwhile accounts of the proceedings of the 12th of April had appeared in the *Königliche, National, and Neuen Preussischen Zeitung*, which ascribed to me a certain merit for having relieved the Emperor from the difficulty of breathing, about which rumours had penetrated into the capital. Following on this were the accounts which Mackenzie had endeavoured to stir up in the indicated newspapers, and which were not only couched in a tone offensive to me, but also described in a most spiteful manner my share in the treatment of the Emperor. Many English journals had already spoken in the spoken in an aggressive manner of the proceedings of the 12th of April, and simply declared that they had obtained their information from the two English physicians of the Emperor (see the *Sunday Times* of the 29th of April). Looking upon these attacks of Mackenzie as dishonourable, and against me, on the morning of the 25th of April, when, after subsidence of the increased temperature and definite improvement of the general condition, I was again summoned to a consultation, I handed to Mackenzie a letter, which he subsequently published. In this I wrote to him that his declarations in the above-named journals placed me for the future under the necessity only so far to communicate with him as professional duty might require. The circumstance, until now unknown in the history of medical consultations, that one of two physicians in charge of the same sick bed should publicly offend the other in political journals induced me to take a further step, for the reason that the attacks upon the *conféres* had been dated from the Castle of Charlottenburg; that is, the very ante-chamber of the Emperor. I begged Her Majesty the Empress graciously to relieve me from the necessity of being any longer a fellow-worker with Sir Morell Mackenzie. My place, after the 30th of April, was occupied by Professor Privy Councillor or I Surgeon-General Dr. Bardenheer.

"My withdrawal from the treatment of the Emperor is represented in the most disadvantageous manner possible through the well-known communication of Mackenzie to the correspondent of the *Pall Mall Gazette* of the 15th of May, 1888.

"I need not retrace Mackenzie's assertion of 'the small esteem in which I was held at Court,' but I wish to establish the fact that this last attempt to oust out the German *conféres* who once had agreed to his being summoned to Berlin, and to overwhelm them with the most serious imaginable reproaches, had been preceded by quite a series of similar actions.

"Throughout the whole sad history of the disease of our patient and long-suffering Emperor it was the endeavour of Sir Morell Mackenzie to ascribe every change for the worse of the condition of the Emperor's patient, not to the natural, necessary, and inevitable progress of the disease, but always to lay the blame for it upon one of his colleagues. Gerhardt was first accused of having, by his cauterizations, changed the original harmless growth into a cancer. In the 10th of November and in February, besides Schritter, and

instead of Kussmaul, I wished Gerhardt again to be called in, it was maintained that this could not possibly be done, since the whole unfortunate turn of events had been his fault. Bramann had made a false incision, Schröder, by an unskillful change of the cannula, and I by the choice of a cannula unsuited for the after-treatment, had occasioned the bloody expectoration and the erosion of the tracheæ. Finally, my forced introduction of the cannula on the 12th of April had to bear the blame of the unfortunate course of the disease, which already, however, dated from the 6th of April, since it had occasioned the formation of a great flask-shaped abscess in the mediastinum. But the post-mortem examination showed that the mucous membrane of the tracheæ, at the point where the lower portion of our cannula had rested, was smooth, without a trace of a cicatrix or of irritation, and that the cellular tissue around this portion of the air tube showed, as the pathologist who made the post-mortem has dictated, 'completely normal conditions.' A comparison with the passage bearing upon the question in the account of the post-mortem examination shows this beyond doubt. Quite apart from the prolongation which must have been occasioned by the extension of the sinuous walls of the large cavity into which, according to Bardeleben's report, the larynx and tracheæ had been changed, the gangrenous destruction of the carcinomatous infiltration reached barely 2½ centimetres down the windpipe. Even the shortest of our cannulas extended at least to a length of four or five centimetres into the tracheæ; so that it was not dead and healthy tissue, but from the time when I had shown the approach of the cancerous tumour to the cannula, first on the 25th of March, the latter, in order to reach the healthy portion of the tracheæ, had to pass through the fungating and gangrenously ulcerated cancerous substance.

"All the reproaches cast upon me I, as well as my other colleagues, whose reports are here appended, have left unanswered. It was only when the *British Medical Journal*, in its number for the 28th of April, asserted my silence to be proof of my guilt, that I declared before those of my colleagues who have chosen me to be one of their presidents, the members of the Berlin Medical Society, on the 2d of May, 1888, that if the *British Medical Journal* were not a paper whose scientific value I esteem in an extraordinary degree, I should still pursue the same course. I have kept silence hitherto, not because I was in the wrong, but because I, like every honourable British and German physician, do not speak publicly of what passes by the sick bed of my patients. I have no ground for the single word of this declaration, although it has brought upon me a veritable storm of reproaches. Mackenzie especially endeavoured in No. 1,448 of the *British Medical Journal*, and in other journals to use to my disadvantage the assertion that I had attacked him, that I had anonymously, that I was on intimate terms with the correspondents of the two great German and English papers, the *Kölnische Zeitung* and *The Times*, Messrs. Fischer and Lowe. I have not up to this time the honour of a close acquaintance with either of these gentlemen. I have only once seen Herr Fischer, at a dinner given by one of my colleagues in November, 1887, where, together with many others, this doctor was introduced to me by my hospitable host. Mr. Lowe came to me at the time of his Press contest with Mackenzie, eight days after the appearance of Mackenzie's declaration in the German papers, and, therefore, after my retirement from the consultations on the case of His Majesty. He asked me to be allowed to look at the letter which Mackenzie had written to me on the 12th of April. I made no objection to show it to him, as I had shown it to several friendly colleagues and to my surgeon. I then requested Mr. Lowe not further to appeal to me, as I wished to give no information to the public about the case. Herr Fischer and Mr. Lowe are prepared to testify to the truth of my assertion. The *Kölnischen*, the *Neuen Preussischen*, and the *National Zeitung* have already testified, in special declarations published in their columns, and which were as definite as explicit, that I never, either directly or indirectly, had any relations with them. It must be assumed that the dictators of these papers utter an absolute falsehood, and

that the testimony of Messrs. Fischer and Lowe is also false, or else that the so-called anonymous attacks, which Mackenzie and the Press supporting him have attributed to me, are simply a fable—a fable invented in order to excuse the publications against me of Sir Morell and of his dependants. Not a single reporter is able to boast, while Gerhardt, Bramann, and I had charge of the sick bed, to have heard from us one syllable. I have never enabled a single interviewer to report the substance of a conversation with me, while it has been officially ascertained that 14 correspondents, who had been furnished with 'entrance cards,' were daily received by Mackenzie at the Castle of Charlottenburg, and that English, German, and American newspapers published almost every week long columns of the reports which he had supplied to them."

The disease of His Majesty was apparently arrested for only a short time. The evening exacerbations of fever became continuous. There was at first a slow, hectic, loss of strength, and afterwards, as pneumonia supervened, a speedy termination. Upon the last proceedings information is conveyed in the annexed report of Medicinal Privy Councillor Dr. Bardeleben.

REPORT OF MEDICAL PRIVY COUNCILLOR PROFESSOR DR. BARDELEBEN.

"On Monday, the 30th of April, 1888, in consequence of a command communicated to me on the previous evening by His Majesty's physician, Sir Morell, I went for the first time in the Castle of Charlottenburg. The shield of the double cannula inserted in the windpipe was surrounded by a half-circle of red, spongy prominences, which gave me the impression of fungating cancer; the lower margin of the shield cut into these prominences. When I pointed out this to Sir Morell, he promised me that he would prepare for the day following another cannula, which should fulfil my wishes. In the subsequent consultation with the other physicians I put the question whether any one among them considered the malady of His Majesty not to be cancer, and begged that any who differed from the opinion that it was cancer would so express themselves. No one of the gentlemen expressed any difference. I thereupon said positively that we were all agreed in our diagnosis. On Tuesday, May 1, 9 a.m.—Sir Morell Mackenzie took out the old double cannula, upon which stinking shreds of tissue and about 50 grammes of ill-smelling pus were discharged by coughing through the opening of the windpipe. In the removed cannula was found a fragment of cartilage, about a centimetre long, and a little more than one millimetre in thickness and in breadth. The new cannula, of which the shield fulfilled the wish that I had expressed yesterday, and did not cut into the granulations, was introduced by Sir Morell without difficulty. The fatal canula is, so far as can be seen, full of smooth red granulations, which appeared to have a much firmer structure than those which surround the external opening."

"It could not be ascertained whence the pus came; certainly the fistula itself, in which the cannula was placed, was not large enough to produce or to harbour such a quantity."

"On handling the neck, I found the region of the larynx not swollen, and less firm than in a healthy larynx. On the contrary, the neighbourhood of the tracheal opening was very hard. No swelling could be discovered in the neck, but on the left and below, near the collar bone, I found a hard, not accurately-defined lump about the size of a hazel nut, which formed, however, no visible projection. I was compelled to complete this examination very quickly, since the other physicians told me that His Majesty highly objected to it."

"Wednesday, May 2.—I found the cannula in good position, the granulations not compressed by the margin of the shield. A quantity of pus was again discharged through the cannula, some pain was complained of in swallowing, the temperature taken under the tongue and the frequency of the pulse were not in coincidence, the first being stated to be normal, or nearly normal; while the latter exceeded 100, which for a man of the stately figure of His Majesty, especially in the resting position, very much exceeded the normal."

"Friday, May 4, 9 a.m.—We were informed at the consultation that the night had been good; also as a fact the appearance of His Majesty was better; the purulent expectoration was still abundant.

"Sunday, May 6, 9 a.m.—We again found a quantity of evil-smelling purulent expectoration. The decoction of condurage hitherto administered has had no manifest effect, and decoction of cinchona was substituted for it.

"Monday, May 7.—Discharge of pus still considerable.

"Wednesday, May 9.—In the change of the cannula, which was effected without any difficulty, it was observed that the swellings around the fistula had entirely disappeared, and that the fistulous opening had now a smooth sharp margin. The external skin in the neighbourhood was not at all reddened.

"Friday, May 11.—The purulent expectoration has diminished, but is still fetid.

"Monday, May 14.—The general condition has manifestly improved, the pulse is somewhat less frequent, but His Majesty has painful sensations in the fauces, and his uvula is swollen. I could discover no ground for the fear expressed by Sir Morell of a perforation of the oesophagus. At any rate, there is nothing to lead to the belief that the lower end of the cannula exerts pressure upon the posterior wall of the windpipe.

"Wednesday, May 16.—The general condition is better.

"Friday, May 18.—No important change. The fetid expectoration continues abundant.

"Sunday evening, May 20.—Change of cannula without difficulty. The granulations in the neck are re-appearing, and are certainly rapidly increasing. On my recommendation they were sprinkled with nitrate of bismuth.

"Monday, May 21.—General condition less good. The granulations which had been sprinkled with bismuth are blackened, which plainly shows that putrid fluids or gases must have come in contact with them.

"Wednesday, May 23.—Condition essentially the same.

"Friday, May 25.—The granulations around the fistulous opening, especially at the lower portion, are projecting more strongly above a clearly-recognizable hard swelling.

"Saturday, May 26.—On account of the change of cannula I was summoned to Charlottenburg. It was easily accomplished, but there followed a very abundant purulent discharge of gangrenous odour.

"Monday, May 28.—The granulations increase rapidly, but under the influence of bismuth are apparently about to come away.

"Wednesday, May 30.—The neighbourhood of the fistula almost exactly in the same condition. Indication of a perforation of the oesophagus is not at all present. The ill-smelling expectoration abundant as before. The appetite is very small. The evening temperature for the last few days has been constantly nearly 1 deg. higher than normal.

"Friday, June 1.—Last consultation in Charlottenburg. No essential change, the general condition certainly not worse, the swellings around the fistula's openings increased, the fistula itself appears to have become wider.

"Sunday, June 3.—First consultation in the Castle of Friedrichskron. The injury which was feared from the journey has in no respect occurred, but the swellings around the fistulous opening have increased, and in consequence of the treatment with bismuth they have become less sensitive. Insufflation to be energetically continued.

"Wednesday, June 6.—The abundant expectoration with the putrid smell, and the febrile evening temperature always continue.

"Friday, June 8.—It was reported that during the past night, in drinking milk, some of it flowed out through the fistulous opening, and it was thence concluded that a perforation into the oesophagus had occurred. I thereupon observed that in a perforation to the oesophagus it was highly probable that larger quantities of fluid would have immediately found their way into the air passages, and that it was more probable, if any perforation had occurred, that it was in the region of the larynx, or at the boundary between the larynx and the windpipe. The cannula was so loose that

it could not exert any pressure on the posterior wall of the air tube. It was then generally recognized that the perforation, if such, indeed, were present, must be in the region of the larynx, but that the flowing of the milk through the tracheal fistula might very well happen from the entrance of the milk into the upper opening of the larynx, which already, by the progress of the disease, must be essentially altered in its structure and function. A modified form of Trendelenburg's tampon cannula was ordered to be introduced.

"Saturday, June 9.—Called to Friedrichskron in the evening. I found no difficulty in the introduction and insufflation of the tampon cannula. The fungating masses in the neighbourhood of the fistula were changed to blackish, dry, but still fetid masses. They had become detached in great part, and without any bleeding.

"Sunday, June 10.—Swallowing was rendered difficult by the new cannula. The outflow of milk and also of yolk of egg through the fistula was not arrested. There could, therefore, be no doubt that the perforation, if it existed, must be above the cannula. The strength diminishing, the fever increasing.

"Monday, June 11.—Although fluid nourishment was abundantly swallowed, and only a small part escaped through the fistula, the strength steadily diminished, the frequency of the pulse and also of the respiration increased (the latter to 44).

"Tuesday, June 12.—In the morning much evil-smelling pus was discharged from the fistula. Since a large portion of the milk that was drunk escaped through the fistula, it was decided to attempt artificial nourishment by a flexible tube carried into the oesophagus. I received a command to return to Friedrichskron for this purpose, and to remain there during the night. At midday half a litre, and in the evening a litre of milk, with cream, was pumped in. The pulse in the evening 116, temperature 39.5, respiration only 24.

"Wednesday, June 13.—In the early morning a litre of milk with cream was again pumped in. The temperature in the morning was 39.5, respiration 24, but in the evening the number of respirations increased to 60, the pulse to 130, and the colour of the skin appeared cyanotic. The pumping in of the milk in the evening was accompanied by vomiting; the strength sunk steadily. I again remained during the night at Friedrichskron.

"Thursday, June 14.—The evil smell of the matter flowing out of the fistula has constantly increased. The loss of strength still continues, notwithstanding the repeated administration of milk. In the morning pulse 140, respirations 48, midday respirations 80, evening 140. Already, in the course of the forenoon, I had to inform the Minister of Justice, in reply to his question when death was likely to occur, that the life of His Majesty could only last for about 24 hours. I subsequently replied in the same manner to His Imperial Highness the Crown Prince and to his Highness the Prince Bismarck. That night, again, I remained at Friedrichskron.

"Friday, June 15.—After repeated temporary losses of consciousness, which occurred with constantly decreasing strength and without agony, death took place at 12 minutes past 11. At 5.30 in the afternoon, with the assistance of Surgeon-General von Wegner and myself, and by the hands of Medicinal Privy Councillor Dr. Hartmann and Herr Conservator Wickersheimer, the preservation of the corpse was commenced with Wickersheimer's fluid, after Surgeon-General von Wegner had established by unquestionable signs that death had actually occurred. The introduction of the necessary quantity of Wickersheimer's fluid into the carotid artery was accomplished without difficulty. The widely-raping fistula in the windpipe, from which the cannula had been removed, appeared to be surrounded by a few small hard lumps; the previously present granulations had become detached. There was no difficulty in removing a great quantity of foul granulations from the much dilated cavity of the larynx, which was limited only by yielding walls, by the insertion and withdrawal of masses of cotton wool. The whole cavity was then filled with

Very slight hypostatis; the portions at the base empty of air contained dilated bronchi, around which were some hemorrhagic layers. On section were seen a great number of foci in the interior of the lobe, most of which were surrounded by hemorrhagic infiltration presenting a granular cut surface, while in the centre were a great number of small, yellowish-white nodules arranged in groups. In some places were foci of the size of a pea, with purulent-looking contents. In others the whole mass is still firm. In the upper lobe are scattered similar, very pale foci, in which a great number of small yellowish spots were grouped together. In these foci, at the anterior margin, very thick discoloured plugs were found within large dilated bronchi, while the vicinity presented an induration of the connective tissue. On opening the bronchi in the lower lobe they were found generally dilated, the walls thickened, the mucous membrane arranged lengthwise in folds, and containing the discoloured debris.

On the right side were quite similar conditions. The apex completely free; but on the lower and posterior part the lung was almost entirely empty of air, with small foci of the above-described conditions, and with the same dilations of the bronchi. The pleural cavities contained nothing further. In removing the larynx the incision was carried immediately in front of the spinal column and immediately behind the oesophagus. In the anterior mediastinum there was a fair amount of fatty tissue, the glands slightly reddened, nothing else changed. The oesophagus and trachea were exposed together, and ligatured. On the left side of the neck, close to the jugular vein, there was a lymphatic gland about the size of a pigeon's egg, which in its interior presented a medullary-looking partly yellowish spot.

On opening the oesophagus there was found, immediately behind the cricoid cartilage, a layer of brownish and whitish membranes, on the removal of which no trace of perforation was present. Epiglottis large, smooth, margin normal. The ary-epiglottic ligaments, especially the left, somewhat swollen, edematous, without ulceration, the posterior space between the arytenoid cartilages somewhat deep, but still without ulceration. At the base of the epiglottis, on the left, there was a medullary nodule the size of a cherry; near it another, flatter, and yet further outwards others, smaller and more recent. There was also a large surface 9 centimetres long, covered throughout by mortifying tissue. The lower margin was formed by the trachea. From there to the thyroid cartilages, no cartilage remained and nothing else of the normal tissue of the trachea.

Of the thyroid cartilages themselves only the upper portions of the lateral parts, with the cornua, were remaining.

The distance of the lower end of the tracheal wound from the lower margin of the incision measured 21 centimetres. This lower margin is sharply defined, passing through the mucous membrane, and exhibits, below, small gray granulations, which cover a surface of about half a centimetre. From this there is normal mucous membrane over the remaining tracheal rings. In the tissue of the still existing parts of the trachea there is no trace of cicatrization, but normal conditions.

With this the examination of the corpse terminated, and it was again closed in the most careful manner.

The microscopic changes were thus summed up by Professors von Waldeyer and Virchow:—Cancerous destruction of the larynx, with secondary disease of a large lymphatic gland on the left side of the neck below, and a cutaneous nodule on the right near the wound. (Oesophagus unaffected; inflammatory destruction of the upper part of the windpipe and its neighbourhood. Numerous dilated bronchi with purid contents. In their neighbourhood, broncho-pneumonic suppurating gangrenous patches.

COUNT STOLLBERG-WERNIGROBE.

MORELL MACKENZIE,
T. MARK HOWELL,
VON WEGNER,
BARDELEBEN,

LEUTHOLD,
VON BERGMANN,
VIRCHOW,
WALDEYER,
BRAMANN.

REPORT OF PROFESSORS VIRCHOW AND WALDEYER UPON THE MICROSCOPIC EXAMINATION OF PREPARATIONS

alternate layers of nitrate of bismuth and cotton wool. At the termination of this proceeding the previously very penetrating smell wholly disappeared. Both the fistulous opening and the wound by which the carotid artery had been exposed were closed by sutures.

By the command of His Imperial and Royal Majesty William II., Sir Morell Mackenzie and Dr. Mark Howell were directed prior to the *post-mortem* examination to declare their opinions as to the disease of the late Emperor. In consequence of this they gave the following certificates:—

"Schloss Friedrichrichron, June 26, 1888.
"It is my opinion that the disease from which the Emperor Frederick III. died was cancer. The morbid process probably commenced in deeper tissues, and the cartilaginous structure of the larynx became affected at a very early date. The small growth which was present when I first examined the late Emperor was removed by me by several intra-laryngeal operations, and though all the portions taken away were submitted to Professor Virchow, he was unable to detect in them any evidence of the existence of cancer. The examinations of the sputa made at the beginning of March by Professor Waldeyer, however, led that pathologist to believe that cancer was then present. Whether the disease was originally cancerous or assumed a malignant character some months after its first appearance, it is impossible to state. The fact that perichondritis and caries of the cartilage played an important part in the development of the disease no doubt largely contributed to make it impossible to form a decided opinion as to its nature until quite recently.
"MORELL MACKENZIE."

"June 16, 1888.
"So far as my observations since last August permit me to form an opinion, I concur entirely with Sir Morell Mackenzie's view.
"T. MARK HOWELL."

MEDICAL PROTOCOL CONCERNING THE RESULTS OF THE EXAMINATION OF THE CORPSE OF HIS MAJESTY THE LATE EMPEROR AND KING FREDERICK III.

"Schloss Friedrichrichron, June 16, 1888.
"On the neck there was a linear wound, 6½ centimetres in length, closed by sutures, with somewhat dry margins, and on the right side of this a flat pale swelling, two centimetres in height, 1½ in breadth, and half a centimetre in thickness. Within the wound there was a large quantity of cotton wool, with bismuth, after the removal of which a cavity remained, which was five centimetres deep, nearly 2½ centimetres in length, and the opening of which, after the removal of the suture, gaped to about 2½ centimetres. The margins of the wound are somewhat hard, elevated, and rather tense. An incision was made over the centre of the breast bone, and from thence was extended subcutaneously to the right and upwards; by the side of the wound in the neck, to that through which the injection had been made into the carotid artery. An incision made through the already mentioned nodule showed a somewhat red, rather firm, whitish tissue, more white at its lower part, from which on scraping a whitish juice exuded. The nodule was situated in the skin, or partly in the subcutaneous tissue, the underlying muscles being completely free.

A similar incision was next made towards the left. Here also the muscles were found to be normal, but higher up they were very tense. Immediately in front of the larynx there was a large tumour on the left side, at the lower part of which there was an induration of medullary aspect.

"On a more complete exposure of the thorax a considerable ossification of the first rib on the left was discovered. On opening the chest, the pale gray lungs filled the pleural cavity almost completely, concealing the heart. On the left side there were several small projections, none of which had spots could be covered by layers of loose connective tissue; only on one place, near the anterior margin, there was a well-defined lobular, polygonal area, with dull, somewhat uneven surface. The left lung, when lifted, appeared externally to be quite healthy at its posterior lower and upper parts. It everywhere contained air, even to the lowest margin of the inferior lobe close to the diaphragm.

OBTAINED FROM THE BODY OF THE LATE EMPEROR
FREDERICK.

(1.) The larger nodule at the base of the epiglottis shows externally unchanged mucous membrane, with cylinder epithelium; but in the interior an alveolar arrangement with epidermoidal contents. The cells of the latter are large and highly developed. Concentrically arranged cell groups were not observed.

(2.) The cutaneous nodule on the right side of the wound in the neck is covered with very thin, but otherwise unchanged epidermis; the cancerous growth reaches very nearly to the surface. Its chief development has occurred in the deeper parts, where well-defined nests are present with concentric arrangement of the cells. Isolated normal portions, such as sweat glands, are still existing between the cancerous masses.

(3.) The lymphatic gland on the left side of the neck is changed in the highest degree. Its normal structure has disappeared, and it consists throughout of a lax alveolar tissue, the interspaces of which are completely filled with epidermoidal cells with large nuclei, many of which cells possess brush-like edges.

(4.) The contents of the bronchi correspond exactly with the description given in his report of the 19th of May of this year by the undersigned Prof. Virchow, — of the matters contained in the expectoration; moreover, in isolated spots there were considerable collections of small shining fat corpuscles resembling the corpuscles of milk.

(5.) In the pulmonary foci were dense collections of pus corpuscles, but no cancer cells. The natural alveolar structure was still clearly visible.

RUDOLPH VIRCHOW. E
WILHELM WALDEYER.

No commentary is required.



